ALIMENTARY TOXAEMIA.

PAPERS READ AT THE OPENING OF A DISCUSSION AT THE ROYAL SOCIETY OF MEDICINE.

GENERAL INTRODUCTION.

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THE term "alimentary toxaemia" at once shows our ignorance, for it is unscientific to group cases of poisoning according to the point of entrance of the poison; they should be grouped according to the variety of the poison; it is a minor matter whether our murderer comes in at the window or the door. Further, the term is too wide; an illness due to any poison absorbed anywhere from the mouth to the anus is strictly an alimentary toxaemia, but the phrase would hardly cover a case of opium poisoning. The user of it probably wishes to suggest that an illness is due to poisons made by micro-organisms resident in the alimentary canal, although, with our present knowledge, he can never name the poisons, nor is he certain of the offending micro-organisms; still we are equally ignorant of the poison in uraemia and diabetic coma. But it is not clear that it may not be used when micro-organisms from the alimentary tract—for example, *Bacillus coli*—pass into the blood and so cause illness, and it is somewhat confusing that if infected food causes poisoning we talk of food poisoning, not food toxaemia; on the other hand, when the food is not infected by pathogenic micro-organisms but makes the person who eats it ill, he is by some said to be suffering from alimentary toxaemia—for example, as in a person who has urticaria after eating strawberries.

The simplest alimentary toxaemia is that due to pyorrhoea alveolaris. This local trouble in the mouth leads to imperfect mastication, hence large pieces of food are swallowed which cannot be digested, and if they contain micro-organisms which, if the mass were properly masticated, would be set free in the stomach and destroyed there, they may indirectly lead to the production of poisons in the intestine. Further, the micro-organisms discharged in the pus from the gums may be swallowed, and it is possible that the gastric secretions, being abnormal or deficient, may not kill them, or that if the stomach is well filled with solid food and the micro-organisms are then washed down with a draught of water, they, suspended in the water, will be rapidly passed through the stomach on the top of the solid food, and hence reach the intestine and cause intestinal toxaemia. It may be that in some diseases micro-organisms found in the intestine have been excreted from the blood, and that such organisms may when in the intestine manufacture poisons. Micro-organisms taken into the blood from the diseased gums may perhaps cause intestinal toxaemia in this way. Lastly, the micro-organisms in the gums may pass into the blood, and cause septicaemia varying from mild to severe. I have met with several fatal cases, and very many persons owe general ill-health or chronic indigestion to pyorrhoea. It is surprising how often this is overlooked. When seeing a patient for the first time, it is as important to examine the teeth as to feel the pulse. Although most common among poor, ill-educated people, pyorrhoea is often to be found in those who presumably clean their teeth properly and frequently; sufferers from it are unaware that they have anything amiss with their teeth. Its presence does not prevent the patient from having other illnesses; sometimes these are wrongly attributed to pyorrhoea. It is dangerous to remove too many affected teeth at once, for a rapid absorption of micro-organisms may take place by the damaged vessels. The value of vaccines will be discussed later by others. My own practice is to give them, for I have never known them do harm in this condition, and I think I have seen them do good.

When we consider bacterial poisons formed in the gastro-intestinal tract, the difficulties are so great that we may almost despair of understanding the subject. External temperature is said to play a part, for although in temperate and tropical climates the lower intestines of animals which have been weaned swarm with micro-organisms—a human being excretes daily 128 billions, 99 per cent. of which are dead, in the faeces—yet the intestinal contents of arctic animals are by some observers stated to be sterile, or almost so, suggesting that it would be a good thing to establish at Spitzbergen a health resort for those thought to be suffering from alimentary toxaemia. Ill understood alterations in the gastro-intestinal contents must influence their bacteriology; thus, *Bacillus coli* is usually confined to the large intestine, but I know a woman suffering from severe dyspepsia and in whom lavage always shows the contents of the stomach to be swarming with *Bacillus coli*. Then the presence of one micro-organism affects others; for example, one of the chief functions of the *Bacillus coli* is to smother others, either by making bodies poisonous to them or by withdrawing their nourishment; it thus kills typhoid bacilli—a fact of interest when we remember that *Bacillus coli* may often be found in the urine of those afflicted with typhoid fever. On the other hand, the *Bacillus coli* may itself be killed by invaders—for example, Morgan's bacillus, *B. suipestifer*, *B. enteritidis*. Then the same micro-organism may act differently in different hosts—for example, one person's strain of colon bacillus often differs from another's. Again, alterations at one part of the intestine will affect processes going on lower down; for instance, colon bacilli have no effect on proteins, but they decompose (putrefy) peptones. If, therefore, there is complete absorption in the small intestine no peptones will reach the large, and so there will be no putrefaction, nor will there be if only unaltered proteins reach the large intestine, but any peptones will putrefy. We hope to hear from the bacteriologists which are the micro-organisms causing alimentary toxaemia. Herter taught us that there are probably three groups of cases:

(*a*) The indolic, in which the probable fault was that the colon bacillus invaded the lower part of the small intestine, and the patient was unable to digest carbohydrates, and usually passed abundance of indican.

(*b*) The saccharo-butyric, in which the organism mostly concerned is the *B. aerogenes capsulatus*; the abnormal changes here occur in the large intestine.

(*c*) A group combined of *a* and *b*.

We must, when thinking of alimentary toxaemia, bear in mind that the culture medium itself is as important as the bacteria, and therefore alterations of diet may influence the production of intestinal poisons as completely as bacteria themselves. A good instance of this is the improvement that follows the withdrawal of carbohydrates in cases of carbohydrate dyspepsia.

Those who ascribe most to alimentary toxaemia are unable to tell us what the poisons are. Much work has been done on the excretion of indican and ethereal sulphates in the urine, and there is no doubt that an excess of indican is often associated with serious intestinal disturbance, but many persons pass large amounts of indican for many years and remain in good health; on the other hand, indican is not passed in many instances in which the patient might be thought to have alimentary toxaemia. It is generally allowed that the poison is not indol, indican, or ethereal sulphates. Indeed, just as we do not know what the poison is in uraemia or diabetic coma, so we do not know what it is in the illnesses ascribed to intestinal toxaemia, nor do we know for certain which are, in any case, the offending micro-organisms, nor do we understand the circumstances favouring their appearance and development, and, unfortunately, the circumstances cannot be exactly reproduced in the laboratory. Further, it would not necessarily follow that if, say, by subcutaneous injection certain symptoms were produced, the same would follow when the poison was absorbed from the intestine; mercury inhaled causes tremors, but not when taken by the mouth. Surely all this being so, statements should be made cautiously, yet one reads that indol-forming organisms must be harmful because they are prominent, and many equally foolish arguments. Nevertheless, some very suggestive work has been recently done by Mellanby and Twort and others, who have isolated creatin-destroying micro-organisms from the alimentary canal, and their experiments show that in the intestines of animals another bacillus forms β imidazolethylamine, which is a powerful poison, from histidine, but the process cannot take place in an acid medium. This poison is probably destroyed in the liver,

and it is suggested may be a cause of cyclic vomiting. It would be very interesting to see if it is present in a piece of gut excised at an operation on the human subject. Bertrand and Berthelot have called the micro-organism *B. aminophilus intestinalis*.

But even if we knew all about the formation of the toxin, and had identified it in the intestine, our difficulties would not be at an end, for before it reached the general circulation it might be altered in its passage through the intestinal wall or in the liver. Indeed, it is possible that sometimes alimentary toxaemia may be a hepatic disease, in which substances absorbed from the intestine in all human beings are so altered in the liver of some that they become poisonous, or abnormal bodies arriving at the liver may so alter it that it produces poisons. Anyhow, there is strong evidence that an important function of the liver is to protect us from poisons absorbed from the intestines, and that its efficient performance of this function depends upon carbohydrates. The difficulty is well illustrated by cirrhosis of the liver, which was formerly always ascribed to alcohol; but now we know that it occurs in some who do not take alcohol, it does not occur in some who do, nor in animals poisoned by alcohol, and it is a part of some diseases in which alcohol plays no part—clearly some other substances than alcohol can set up the cirrhotic process; and probably, under circumstances of which we know nothing, alcohol can accelerate the formation of these substances, which may well come from the intestine, and, if so, cirrhosis of the liver may be a form of alimentary toxaemia.

I am afraid our knowledge is not sufficient for us to argue that because certain processes go on in the intestine there must be a clinical condition to which the term "intestinal toxaemia" may be applied; but it does not follow that there are not assemblages of symptoms of which an alimentary toxaemia is such a likely cause that we may with reason assign them to this cause until some other cause is shown to exist. The best example of such an assemblage is that known as carbohydrate dyspepsia. An infant afflicted with this has pyrexia; it loses flesh, but its tissues gain in water; its abdomen is distended by the accumulation of gas in the bowel; it is pale, fretful, and sleeps badly; it is often sick and has diarrhoea. The stools contain green colouring matter and an excess of fatty acids; they irritate the skin round the anus, leading to dermatitis. These symptoms may be produced in a previously healthy child if an excess of carbohydrate is given, and will pass away if that excess is withheld. I would suggest that these are the cases of intestinal toxaemia that should be first studied, for in them we see the problem at its simplest, the illness being induced by a single simple article of food. As this is carbohydrate and the intestines are distended with gas, there is every probability that excessive fermentation accompanies the formation of some poison which is capable of causing pyrexia; indeed, much older children often suffer from attacks of pyrexia which may be prevented by abstention from carbohydrates. Enterogenous cyanosis is a form of intestinal toxaemia from which we might learn much if it were commoner, for we know that in the methaemoglobinaemia variety there is a nitrite in the blood probably derived from some abnormal intestinal process, and that in the sulph-haemoglobinaemia variety hydrogen sulphide is concerned with the production of the disorder, and as the cyanosis has disappeared when the accompanying constipation has been overcome there is every probability that the complaint is really an example of alimentary toxaemia. As nitrites and hydrogen sulphide are simple chemical bodies, it is particularly disappointing that we can discover nothing about the abnormal intestinal processes at the bottom of enterogenous cyanosis, and this should make us particularly careful of dogmatizing when we do not even know what the poisons are. Certainly sufferers from enterogenous cyanosis have not the symptoms which it is the fashion now to assign to alimentary toxaemia.

Lately it has been urged with much insistence that many suffer from ill health due to absorption of poisons from the bowel which are formed there because the bowel is imperfectly emptied; or, in the modern terminology, these patients are said to have intestinal toxaemia due to intestinal stasis. That such is the case is very likely. Most people feel miserable if their bowels are not open for some time. Advertisements of medicines designed to keep the bowels open assail us all over the world, many health resorts flourish exceedingly because their natural waters are aperient, colossal fortunes have been made out of the sale of purgatives, the *Pharmacopoeia* contains more examples of the aperient than of any other class of drugs, and the improvement in health that follows keeping the bowels properly open is often so striking that, from the clinical point of view, there is strong evidence that we may suppose such an alimentary toxaemia secondary to intestinal stasis, although we are unable to indicate the poison or to say how it is formed. But it must never be forgotten that individuals vary exceedingly about their bowels; some are perfectly well if the bowels are only open once a week. Presumably, if intestinal stasis is an important factor in causing alimentary toxaemia, these persons do not readily form poisons, or, if they do, they are immune to them. It has, however, been stated recently that the results of chronic alimentary toxaemia are much more numerous than was previously thought, and that the cause of the failure to empty the bowel is frequently mechanical and has been often overlooked.

To take the last point first. It is not necessary for the production of alimentary toxaemia that there should be any mechanical obstruction to the passage of the contents of the bowel. If the poisons are bacterial the quantity of them produced will depend upon the number of micro-organisms and the suitability of the medium for their growth, which, for example, might be so favourable that toxaemia would result without any stasis; therefore, toxaemia is not proof of stasis. Those who attach great importance to mechanical stasis differ much among themselves as to its cause. Some attribute it to excessively large valves of Houston, some to pericolitis, some to dropping of the colon, some to adhesions around the ascending colon, some to spur formations at the hepatic and splenic flexures, some to abnormal mobility of the caecum, although others say that the mobility of the caecum thought to be abnormal is normal, and some to the development of various bands and abnormal mesenteries that drag the bowel and kink it; but the reasons given for thinking that these bands are evolutionary are by no means convincing, most observers regard them as inflammatory. We have no sufficiently large number of cases proving that any of these conditions are more common in those supposed to be suffering from intestinal toxaemia than in those who are not, and it is strange that when the bowels are by chronic peritonitis matted into one mass, so that there must be many abnormal kinks and great interference to peristalsis must exist, yet the symptoms said to be indicative of alimentary toxaemia are not constantly present, and even intestinal obstruction is rare. Although it may be that some of these mechanical causes lead to alimentary toxaemia, the matter cannot be regarded as proved, and it must be remembered that the coexistence of two phenomena does not prove that they stand in the relation of cause and effect; they may have a common cause—indeed, it is possible that the abnormal bands and the toxaemia are induced by the same cause. Much investigation with *x* rays has been performed upon those thought to be suffering from alimentary toxaemia, and there is no doubt that the *x* rays have added and will add enormously to our knowledge of intestinal movements, both normal and abnormal, but we must bear in mind that although *x* rays may show a kink, they cannot show the cause of the kink; that if large amounts of such a heavy substance as bismuth are used, the bowels can hardly be said to be acting normally; that we ought to be provided with dozens of *x*-ray pictures of dozens of healthy people taking the same amount of bismuth; that when we look upon a screen we only see a plane picture. All inferences from *x*-ray examinations as to whether the duodenum or any other part of the bowel is dilated must be received with caution, for the rays from the *x*-ray tubes are divergent; we are dealing with a plane picture, and usually the statement is made that the duodenum, for example, is dilated without stating its size or that of the normal duodenum.

We may now turn to the symptoms which these sufferers from alimentary toxaemia are said to show. There is no need to detail them, for they have been recently described over and over again in the medical press. I am one of those who think it probable that they

are due to alimentary toxaemia, but the poison has never been found, the symptoms have never been produced experimentally, few observers have up to the present even given an opinion on the matter, and in their extreme degree these symptoms are in my experience decidedly rare, yet we find it definitely stated, time after time, that these symptoms are due to alimentary toxaemia, but I submit that the evidence does not amount to proof, although it renders the suggestion probable. If we are not careful we shall, before we know where we are, be invoking the aid of alimentary toxaemia in the same reprehensibly loose way as gout, uric acid diathesis, and congestion of the liver have been called in to explain various vague symptoms which we do not understand.

So many conditions which cannot be called symptoms have been ascribed to intestinal stasis and consequent alimentary toxaemia, that they cannot all be examined now, but every one of them needs more careful scrutiny than it has received. Cystic disease of the breast, cancer of many parts, and duodenal ulcer, for example, have been set down to intestinal stasis, but it has not been shown that, among a large number of sufferers from any one of these, intestinal stasis is more common than among those in whom these conditions are not present. Then, intestinal stasis is commoner in women, duodenal ulcer in men, yet the first is said to cause the second. This casts so much doubt on the correctness of this suggested etiology that if there are special circumstances which can dispel the doubt they ought to be so convincingly stated that their adequacy is accepted by all. Nor have any of these conditions been induced in animals by artificially induced intestinal stasis. Then, again, we read that the "so-called Bright's disease is merely a product of intestinal stasis." There are many varieties of Bright's disease—which is meant? That being settled, let it be shown that a considerable proportion of those suffering from that variety of Bright's disease have alimentary toxaemia. This has not yet been done. Again, I see it suggested that curing alimentary toxaemia cured a case of exophthalmic goitre; no such conclusion can be drawn from a single case, for exophthalmic goitre is a disease which tends to get well, especially if the patient rests, and this patient rested in bed during her operation for intestinal stasis. A woman suffering from exophthalmic goitre was admitted under me with typhoid fever; when she was discharged her exophthalmic goitre was cured. This does not show any relationship between typhoid fever and exophthalmic goitre, which was probably cured by the rest in bed.

If it is allowed that ill health is due to alimentary toxaemia caused by bacterial changes, the best treatment would be to stop the ingestion of the offending bacteria, but as we do not know what they are we cannot do this; or to give intestinal antiseptics, which experience has shown to be of limited use, although I think their uselessness has been exaggerated, for occasionally cyllin seems to do good; or to alter the medium in which the bacteria grow, which is successful when we cure children by diminishing their carbohydrates; or to give other micro-organisms which will render difficult the growth of the offending micro-organism, this is the principle of the sour milk cure, from which much was hoped but which has been disappointing; or if there is delay in emptying the intestine, to overcome this.

The last is the commonest mode of treatment, and thousands of people keep themselves in good health by natural aperient waters or some other simple aperient—either food or drug. Abdominal exercises and massage will, if properly carried out, cure many a case of constipation which has resisted all other methods, and the same may be said of a visit to a hydropathic institution or a spa which lays itself out for the treatment of this disorder. Lately some surgeons have been trying to limit the formation of poisons in the intestines by preventing delay by performing an ileo-sigmoidostomy either with or without excision of the colon. When these cases are reported we are always assured that all medical means had been adopted without benefit, but we are never told what the medical means were. It would add greatly to our knowledge if our surgical friends would give precise details of the medical treatment, the patient's statements being corroborated by the various doctors who treated her. A suspicion comes into one's mind sometimes that perhaps some surgeons do not know all the means the physician has at his command for the treatment of delayed action of the bowels.

Some have opened the appendix and washed the bowel through from the appendix to the anus; if the stasis is in the small intestine this operation will not be of much use, but the success which may follow it when performed for colitis is so brilliant that when the stasis is in the large bowel much benefit might be expected. One thing is certain—namely, that if surgical interference is ever necessary the patient for whom it is necessary is a reproach to her doctors if she has consulted any in the early periods of her illness, for the condition never ought to be allowed to advance to the stage which requires surgery, and, although no other operations may be feasible, yet short-circuiting and opening the appendix are only makeshifts, for neither removes the cause of the intestinal stasis.

It is too early to speak definitely as to the results of these short-circuiting operations. Occasionally the operation itself is fatal. I, like some others, have seen some women who are not in the least better for having had it done; on the other hand, many successes have been reported, but sometimes more than one operation has been required, and sometimes aperients are still necessary after operation. It would be a good thing if some of these cases were more fully reported; photographs before and a year after the operation would be useful, and the patients who had been operated on, whether successfully or not, might be shown before this society; and it is desirable to have the after-history of every case that has ever undergone operation, for it may be that any improvement that ensues is not permanent; this is especially important, as many of the subjects of operation are neurotic women, and we all know that the immediate effects of operation on them may be extraordinary. Further, it is unfortunate that the most frequent symptom—namely, pain—is subjective.

In this brief survey I have tried to indicate the direction which future work should take. I hope I have not been too critical; if any think so, I would beg them to remember that friendly criticism can do no harm. Our interest in alimentary toxaemia has been awakened by the fascinating suggestions of Metchnikoff and by the bold extension of them by Mr. Arbuthnot Lane, but it is an approved principle of science that the results of one worker cannot be accepted until confirmed by others. We ought, therefore, to withhold our verdict on many points until we see whether confirmation is forthcoming. In the year 600 A.D. Isidorus Hispalensis, Bishop of Seville, wrote: "For a medical man should know the *ars rhetorica* that he may be able to support with sound arguments the matters which he deals with; and also the *ars dialectica*, so that by the exercise of reason he may investigate the causes of sickness for the purposes of cure." That is true now as then.

THE BACTERIOLOGY OF THE ALIMENTARY CANAL.

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THE interests of this discussion will, I think, best be served if I devote my allotted time first to a general review of the bacterial flora of the alimentary canal and then to a consideration of the part played by bacteria in the production of alimentary toxaemia. I must leave to others the more contentious details of this large subject.

THE CONDITIONS FOR BACTERIAL GROWTH OFFERED BY THE ALIMENTARY CANAL.

These conditions are for the most part ideal. Bacteria find there an equable temperature, and the moisture they require, while the supply of foodstuffs is ample and varied. Free oxygen is largely absent in the intestine, except perhaps in certain diarrhoeal conditions; we therefore find that the habitual tenants of the gut are facultative anaërobes, and that even strict anaërobes can grow there

freely. It is well known that anaërobic conditions favour profound chemical cleavages in the medium in which bacteria are growing.

While the reaction of the greater part of the alimentary canal is alkaline, and thus favourable for bacterial growth, the local acidity presented by the gastric contents is not merely unfavourable but actually destructive to the more sensitive bacteria ingested. The pneumococcus, common in the mouth, does not seem as a rule to reach the intestine, and it is believed that normal gastric acidity is a safeguard against cholera.

There is a lack of repose in the contents of the alimentary canal; its tenants are liable to daily expulsion. Too much stress must not be laid on this, for a bacterium can multiply a thousand-millionfold during the average time occupied by its transit from mouth to anus, and vast numbers must remain in the various recesses of the canal or adherent to its mucosa. Nevertheless, stasis is a fertile adjuvant to bacterial multiplication, and hence to alimentary toxaemia, whether in a dilated stomach or under the commoner form of constipation.

The Biological Characters of the Normal Flora of the Canal.

If we knew as much about the protozoan inhabitants of the alimentary canal as we do about its bacteria, we should probably find much the same laws governing both, but we know little on this subject, and I must pass the fauna by.

Of the flora of the canal we can safely affirm that it is *sui generis*. Certain groups of bacteria have specifically adapted themselves to life under the conditions just outlined, and have practically abandoned other modes of existence. Such are the bacilli of the colon group, the majority of the streptococci, and certain anaërobes. So characteristic are these of the alimentary canal of man and animals that by the universal consent of bacteriologists they are taken as indices of the faecal pollution of water, milk, earth, and other substances. They constitute the enormous majority of the normal tenants of the canal. Their biological properties have been moulded by their environment; they grow best at body temperature, they are potential anaërobes, and they show a high capacity for splitting up various foodstuffs, primarily for their own use, but incidentally to the occasional detriment of their host. Moreover, they can withstand considerable periods of desiccation, for, owing to their wholesale expulsion with the faeces, their chance of reaching a new host is thus increased.

The Numbers of Bacteria in the Alimentary Canal and their Variation in Character at Different Levels.

Our knowledge on this point is limited to the bacterial species which can grow on our ordinary culture media. It is likely that agar cultures give us an imperfect idea of the total flora, but we can control our observations by stained films, and in the case of the faeces it would appear that agar cultures, aërobic and anaërobic, yield a moderately true picture of the real state of affairs. In the crypts of the fauces and in dental cavities, on the other hand, there would seem to be many organisms which we cannot cultivate. In the following remarks I can only pretend to deal with the organisms which can readily be cultivated.

In the secretions of the healthy *buccal cavity* bacteria are present, according to Gordon, to the number of 10 to 100 millions per cubic centimetre. The most striking feature of this buccal flora is the overwhelming preponderance of streptococci, which form at least nine-tenths of the total.

In the *stomach* and *duodenum*, on the contrary, bacteria are extremely few. For in health, when the stomach empties itself properly after each meal, it is well scoured, and a large proportion of the bacteria swallowed perish during digestion.

In the *small intestine* bacterial multiplication recommences, but so long as the contents are fluid and pass rapidly along the gut, the numbers are not very high, though they increase in passing downwards. The influence of the bile, which is supposed to check intestinal putrefaction, is of a selective character, for certain of the most typical intestinal bacteria have so acclimatized themselves to it that their powers of growth are in no way impaired. Bacteriologists commonly add bile or sodium taurocholate to their culture media when studying intestinal bacteria, in order to take advantage of this selective action. We have thus learned that bacilli of the colon group can all grow well in presence of bile, and that certain of the hardier streptococci can do the same. On the contrary, the more delicate streptococci and the pneumococcus will not grow in its presence, while such organisms as *B. proteus* are much restricted in growth.

In the *caecum and colon* the conditions for bacterial multiplication become more favourable than anywhere in the alimentary tract. The intestinal contents are here mechanically delayed in order that the last remnants of nutriment may be absorbed, and the numbers of bacteria found in the faeces surpass even those of the buccal cavity. According to Houston the number per gram of normal faeces ranges between 100 and 1,000 million. Supremacy in numbers is divided between the streptococci and members of the *B. coli* group, sometimes the one and sometimes the other predominating. I have usually found *B. coli* the more numerous. In the colon, too, anaërobic bacilli begin, in lesser degree, to assume prominence, while *B. proteus* and sometimes *B. pyocyaneus* are not uncommon.

The Named Bacterial Species of the Flora of the Alimentary Canal.

This subject is one of much difficulty. At any time one is beset with doubts as to the criteria to be employed in deciding specific differences amongst bacteria; it is possible that they scarcely exist in the sense to which we are accustomed amongst higher plants and animals. And nowhere is the difficulty so great as amongst the coliform bacilli and the streptococci, which present infinite gradations in their biological characters. I cannot attempt to deal with this subject here, but must content myself with a few general statements.

The members of the *B. coli* group are roughly classified according to their fermentative reactions with certain sugars and alcohols, and in a more refined manner by their agglutination reactions. The commonest variety is that now recognized as the classical *B. coli communis*, which ferments lactose and dulcite but not saccharose. Hardly less common is its saccharose fermenting variety, whilst the various types known as *B. lactis aerogenes*, *B. acidi lactici*, etc., are frequently met with. Less common are *B. faecalis alkaligenes* and members of the Gaertner group.

As regards the *streptococci*, terminology is even more difficult. The attempts to assign provisional names to the more frequently occurring types, by Horder and myself amongst others, have met with a good deal of adverse criticism, because the sugar reactions, introduced by Gordon, upon which we chiefly relied, have been considered by others to be too variable for the purpose. This is not the place to discuss this very controversial subject, but it will be admitted that the common streptococci of the mouth and intestine are of a relatively harmless nature as compared with *Streptococcus pyogenes*. Personally I believe that a legitimate distinction may be drawn between the streptococcus most abundant in the mouth and upper air passages and a form which is common in the faeces, though it must be admitted that intermediate forms occur, so that one is probably not entitled to regard them as species. These are the types which Horder and I described as *S. salivarius* and *S. faecalis*. Even if all sugar reactions were discarded, it would still, I think, be possible to distinguish the much greater hardiness, vigour of growth, and metabolic activity of the faecal form from the feebleness of the salivary one. I have never been able to find *S. faecalis* in the buccal cavity, though the salivary type is common in the faeces.

Our knowledge of the *anaërobic bacilli* of the alimentary canal is very imperfect. The most abundant appears to be the organism which has been variously termed *B. aerogenes capsulatus*, *B. welchii*, and *B. enteritidis sporogenes*, but, with this, the ordinary putrefying anaërobe, which Klein terms *B. cadaveris sporogenes*, but which has also been described under other names, appears frequently present. In the colon, at all events, free oxygen is so far absent that these organisms, and probably other less well-known anaërobes, can flourish, and it is clear that their activity in breaking down proteins is of a very high order.

While members of the three foregoing groups of bacteria constitute the great mass of the intestinal flora, every plate culture shows that other organisms are also present in small numbers—staphylococci and sarcinae, *B. proteus*, in more than one form, and *B. pyocyaneus*. The last named organism is one with which I have repeatedly met in the intestine, and it is of interest as one which forms soluble metabolic products. As regards *B. proteus*, it would appear that its powers of decomposing protein have been a good deal exaggerated.

The Effects upon the Healthy Body of the Normal Alimentary Flora.

It is sometimes supposed that the intestinal flora performs certain "functions" in the economy of its host. Attempts have been made by more than one observer to rear mammals or birds under germ-free conditions from birth. In many cases the creatures thus treated have not survived for many weeks, but the experiments teach little, for it is at least as likely that premature decease was due to the wholly unnatural conditions under which it was needful to keep the animals as to the absence of bacteria from the alimentary canal. I do not know of any good evidence that it is of benefit to have our intestines swarming with bacteria, many of the products of which seem harmful to us. Bacteria are not actuated by any sentiments of altruism. They take advantage of the favourable conditions offered by the alimentary canal purely for their own good; and if they do us little harm, it is because the whole race of higher animals has been evolved under these necessary conditions, perpetually present from the beginning, so that there has been ample time for the evolution of such protective mechanisms as are needful to neutralize the habitual effects of bacterial commensalism. I refer not merely to defence against bacterial invasion, but to a neutralization of their toxic products. It is conjectured that such injurious substances, absorbed from the alimentary canal, as may escape the alchemy of the liver are neutralized by the secretions of certain of the ductless glands—for example, the thyroid. There can, however, be no doubt that the intestinal flora is not without influence upon the body, even in health, for the more actively metabolic bacteria carry out protein splitting to a point beyond that which can be exercised by the ordinary digestive ferments, and of the soluble products some are known to be toxic.

The Influence of Pathological Conditions upon the Flora of the Alimentary Canal.

Owing to the extreme rapidity with which bacteria can multiply, rapid changes can readily occur in the flora of any part of the alimentary tract, as may be seen in infective conditions. Further, any part of the tract in which retention of the contents is brought about is apt to show an abnormal bacterial flora.

In the mouth and naso-pharynx infective changes are extremely common, and an invading microbe, such as the pneumococcus, *Micrococcus catarrhalis*, or *Streptococcus pyogenes*, may speedily predominate in the local flora. In chronic conditions of oral sepsis, such as dental caries or pyorrhoea alveolaris, there may be an excessive abundance of streptococci of lesser virulence.

Gastric dilatation and incompetence afford an instance of a radical change in the normal flora. The natural acidity of the gastric contents is disturbed, and in the absence of proper emptying and scouring of the viscus, yeasts, sarcinae, and other unnatural tenants come to multiply in the stagnant contents, and may form a conspicuous microscopic feature in the vomit.

Nor, in considering the bacteriology of the alimentary canal, must we forget the gall bladder, which is not rarely the seat of chronic bacterial infection. Usually such infection is by some normal inhabitant of the canal, such as *B. coli*, whereby no great change is brought about. But the infecting agent may be a foreign organism, such as the typhoid bacillus, and when this condition is persistent, as in a typhoid carrier, a more or less permanent addition is made to the flora of the intestine.

The bacterial contents of the small intestine may be profoundly modified in disease. In the rapid peristalsis of acute diarrhoeal conditions the normal inhabitants of the gut are quickly swept away and a new flora may be substituted. Thus, in Asiatic cholera, the contents of the ileum may yield almost a pure culture of the cholera vibrio.

In the colon diarrhoeal conditions may produce a similar effect, so that the liquid dejections may show a predominance of whatever microbe is at the root of the trouble, be it cholera, dysentery, or Gaertner poisoning. But from the point of view of intestinal toxaemia, constipation plays a much more important part than diarrhoea, and its effects must form an essential element in this discussion. Retention of the intestinal contents affords a fruitful field for the multiplication of the normal bacterial flora, and for the full exercise of their fermentative activities, and at the same time it gives opportunity for the absorption of whatever toxic products may be formed.

The Part Played by Bacteria in the Causation of Alimentary Toxaemia.

Having thus shortly considered the nature and properties of the bacteria of the alimentary canal, I must address myself to the second and more difficult part of my task, that of attempting to assess the share which is borne by bacteria in the causation of poisoning from the intestines. If, in this attempt, I trespass in any way on the branches of the subject allotted to others, I must ask pardon.

In the first place I think it necessary, if this discussion is to be of any value, that we should endeavour to reach clear conceptions as to what we mean by "alimentary toxaemia." There are few terms more loosely employed, because we have so little accurate knowledge on the subject. The very terms "toxin" and "toxaemia," though they drop so easily from our lips and soothe our minds with the feeling that at least we have a name for these things even if we know nothing about them, are in truth but confessions of ignorance. The word "toxin" is a convenient one for chemical poisons of which we do not know the composition, but it might be better for clear thinking and the advance of knowledge if we were less ready to cloak our ignorance by the too common use of the term. Our hope of salvation rests with the chemists. The word "toxaemia" is equally vague, and in danger of loose usage, but it is a legitimate word if we employ it to mean the circulation in the blood of chemical poisons whereby they are enabled to attack the cells or tissues for which they have the requisite chemical affinity. By "alimentary toxaemia," therefore, I understand the absorption from the alimentary canal of chemical poisons, of known or unknown composition, in sufficient amount to cause clinical symptoms, the blood having served as the channel of distribution to the tissues which are poisoned.

This definition would exclude all those cases in which actual bacterial invasion of the blood occurs from the alimentary canal, though not those in which there is absorption of the toxic products of bacteria concerned in purely local infection of the canal. I would lay some stress on this because I think it is hardly realized how commonly slight invasions of the blood stream take place; evidence is gradually accumulating to show that the normal intestinal bacteria are constantly gaining access to the blood in trivial numbers, and as constantly destroyed by the various protective mechanisms which the body has been compelled to evolve in order to avert the danger. Only when these mechanisms are in default does serious trouble arise, but it is possible that some of the cases of local disease attributed to toxaemia are really of infective nature.

There are certain alimentary toxaemias which are clearly not of bacterial origin. We subsist on foreign proteins, hydrocarbons and carbohydrates, and of these there is abundant evidence that alien proteins may be toxic and sometimes highly so. The normal processes of digestion break down the foreign protein into somewhat simpler, though still complex, atom groups, which, after absorption, are carried to the liver, whose business it is to reconstitute the protein in a form adapted for human needs. One of the primary functions of the liver is to act as a shield against the toxicity of foreign proteins, and we have evidence that when, by the formation of an Eck's fistula, this function is eliminated, serious toxic results occur. It follows that grave hepatic disease may be the cause of a toxaemia, partly, at least, alimentary in origin, and instances of this, in acute yellow atrophy and some puerperal eclampsias, will at once occur to the mind.

The bacteria in the alimentary canal, in virtue of the high fermentative activity which many of them possess, carry out protein cleavage to a point beyond that which the body demands for its own nutritional needs, and certain of the products which thus arise are actually harmful to the host. But this has always been so, ever since bacteria took up their residence in the alimentary canal of animals, and it has been necessary for animals to evolve some means of chemical antagonism to neutralize this harmful effect. We are still in comparative ignorance of the precise chemical mechanism by which this permanent menace is met in health, but that it is so met is certain, for in health we remain untouched. It is conjectured that one of the functions of the thyroid gland is to deal with this matter. A number of observations by different workers have shown that the activity of this gland is excited by the presence of bacterial toxins, and it has been asserted by certain observers that thyroidectomized animals are abnormally susceptible to infective processes. It is possible that the antitoxic functions of the thyroid extend to chemical poisons other than bacterial toxins. Be this as it may, it is clear that the body in some way compensates the ordinary activities of bacteria in the intestinal tract, so that no harm results. Only when such bacterial decompositions are excessive, and when faecal retention affords unusual opportunities for the absorption of the products, are symptoms manifested.

Thanks to the labours of chemists, our knowledge of the protein decomposition products is fairly extensive, though our knowledge as to their toxicity is incomplete. Most of them appear to be of feeble toxic powers, but it must not too hastily be assumed from animal experiment that such substances as, for example, indol are so harmless as they would appear. I am very far from agreeing with the recent hypothesis suggested by Metchnikoff as to the rôle of indol and allied substances in the causation of arterial degeneration, for the evidence put forward seems to be wholly insufficient. But we can to some extent measure the absorption of indol by the excretion of indican in the urine and correlate its excess with clinical phenomena. The excessive indicanuria in conditions of mental depression and melancholia, for a knowledge of which I have to thank Mr. Mackenzie Wallis, may be of great pathological significance, and may outweigh any negative evidence derived from animal experiment.

There is also a possibility, for the suggestion of which I again owe my thanks to Mr. Wallis, that excessive bacterial activity in the intestine may have its negative as well as its positive influence. Thus, still to take indol as an instance, it is known that this substance is derived from the tryptophane element in proteins. If tryptophane is an important element in tissue nutrition, it may be that excessive splitting up of this substance in the intestine by bacteria may lead to tissue starvation in an important detail. An element in a supposed alimentary toxaemia may possibly be due not so much to the positively toxic action of the derivative as to the absence of the needful substance from which it has been derived. I must leave such considerations to those who follow in this discussion.

Bacteria, however, may do more than provoke merely fermentative changes in the medium in which they are growing. They produce, in virtue of their own intrinsic metabolism, substances of unknown chemical composition which are deleterious to their hosts, and which we must be content to term "toxins" in the absence of more exact knowledge. It is established that a very few—bacteria produce soluble toxins which pass out into the surrounding medium without any disintegration of the bacterial body. These are the pre-eminently "toxic" bacteria, of which the diphtheria and tetanus bacilli are the commonest examples, and they lie outside our present subject. Indeed, almost the only essentially toxic bacterium which could be dragged into the discussion is van Ermengem's *B. botulinus*, present in certain ham poisonings, though *B. pyocyaneus* might perhaps also be included. But the great majority of pathogenic bacteria, and practically all those which are normally saprophytic in the alimentary canal, form no soluble toxins; so far as they possess toxic properties, these reside in the bacterial protoplasm itself and are liberated only on its dissolution—so-called "endotoxins."

Bacteria are, of course, constantly undergoing dissolution in the alimentary canal, and one cannot dispute the possibility of harmful effects from such endotoxins on absorption. But we are in almost complete ignorance of the extent to which alimentary toxaemia rests on such a basis. So far as concerns the normal intestinal flora, I should be disposed to believe that poisoning by bacterial endotoxins plays a comparatively negligible part in the process. As soon as evidence is brought forward showing this to be the case I shall be ready to accept it, but so far there is none, and it is probable that the endotoxins of most of the normal inhabitants of the alimentary canal are of very feeble virulence, though those of the colon bacillus may perhaps prove of some importance. This does not, of course, apply to cases of infective enteritis, in which the absorption of bacterial toxins plays a large part in the production of the constitutional symptoms.

To sum up what I have said as to the part played by bacteria in alimentary toxaemia, it seems to me reasonable to lay down the following propositions:

1. In an important group of cases the poisoning is by foreign proteins, as such, the defect lying in the liver, which ought to shield the body from their effects. With this bacteria have, as a rule, nothing to do.
2. The main effect of bacterial activity in the production of alimentary toxaemia lies in their ability to carry out protein cleavages beyond the capacity of the ordinary digestive ferments, with the formation of products which, when in excess, the body is unable to neutralize.
3. There is at present little evidence that true toxins, derived from the ordinary flora of the gut, soluble or intracellular, play much part in alimentary toxaemia.

ALIMENTARY TOXAEMIA: ITS SYMPTOMS AND TREATMENT.

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The doctrine of intestinal autointoxication was originated by Bouchard, and has formed the foundation for far-reaching speculations. There is little evidence that the normal products of intestinal fermentation and putrefaction are capable of producing disease, and if acetic and butyric acids, indol, skatol, and the like are harmful their effects must not be exaggerated. Sulphuretted hydrogen is only present normally in traces, and much larger quantities may be injected into the rectum without hurt, although admittedly this gas is more harmful when formed in the small intestine or the stomach. Ammonia is converted into harmless urea, while volatile fatty acids and acetic and butyric acids only produce local stimulation, even when present in quantity. Acetone, diacetic acid, and beta-oxybutyric acid are present in the urine, together with various symptoms of disturbed digestion, but this does not prove that the symptoms are due to them. The first two are found in the urine of starving animals with no digestive disturbances, and merely indicate the breaking down of tissue protein. Ptomaines may be present in excess in intestinal contents without any toxaemic results, as, for example, in cystinuria. On the other hand, there is a widespread belief, not without evidence in its favour, that many diseases depend upon the absorption of poisons from the intestine, either introduced with food or formed from it by the fermentative or putrefactive processes in the alimentary tract.

Food Poisons.

In former days food poisoning referred to the accidents that result from the ingestion of substances rendered harmful by the poisons contained in them, but modern research has added to these the effects of microbes and the toxins due to their activity. These last are exclusively produced from animal food; the danger of vegetable food depends solely upon its natural poisons or its accidental contamination by microbes in the water with which it has been washed or in the dust lying on its surface.

Vegetable Food Poisons.

Among the best known poisons from vegetables are those contained in many kinds of mushrooms, and the poisonous effect varies not only with each kind, but with season and place, some being poisonous at one time of the year and not at others, some dangerous in warm countries but harmless in colder climates; some of these poisons are destroyed by boiling, the water in which the mushrooms are cooked becoming highly poisonous.

Phalline, the poison of *Amanita phalloides*, determines destruction of the blood cells and causes choleriform symptoms, with vertigo, delirium and somnolence that may pass into coma, convulsions, and death; or final fatal icterus may occur after a remission of the symptoms has taken place, while should the patient recover, convalescence is slow and the myocardium and kidneys may remain damaged.

Muscarine, the poison of *Amanita muscaria*, causes nervous symptoms resembling alcoholic intoxication with cramps, convulsions, contracted pupils, rapid small pulse, and death in collapse, or recovery may follow a prolonged sleep.

Flour is sometimes poisonous by the accidental admixture of the seeds of tares, cow-wheat, smut, ergotized rye or vetch with the meal of wheat, maize or rye. Adulteration from tares and cow-wheat gives rise to nausea, vomiting, colic, disturbed vision, vertigo, somnolence, and lassitude, which disappear in a few hours. Cow-wheat may also produce convulsions. Smut contains a poison called "githagin," which may determine intense colic with diarrhoea and haemorrhage from the bowels. Ergotized rye causes nausea, vomiting, lassitude, with constipation or diarrhoea, and subsequently local symptoms such as cramps of certain muscles or gangrene of the fingers and toes; vetch poisoning induces spasmodic paraplegia with disorders of sensation and tremors.

Potatoes sometimes produce poisonous symptoms from the presence of solanine, causing slight vertigo, headache, vomiting, dilated pupils, and rapid action of the heart.

Animal Food Poisons.

The putrefaction of animal food leads to the production of (1) ptomaines and (2) leucomaines. The first are formed by putrefaction, the second by the excessive destruction of protein.

Certain poisons are developed spontaneously and apart from microbial infection—for example, oxybetaine from meat and putrefying bones, choline from herring pickle, muscarine from decayed fish, methylgadinine from putrid horseflesh, and ptomatropine from salted sturgeon.

On the other hand, the *Bacillus botulinus* and other microbes of the type Aertryck and the type Gaertner cause a poison, botulin, in putrid ham. Other poisons are formed by the paratyphoid bacillus, by enterococcus and proteus, while the *Bacillus coli* may under certain circumstances enter the blood and make the meat poisonous—as, for example, in hunted animals. Meat preserved in various ways, especially in cold storage, seems to be liable to undergo poisonous decomposition. This is also true of gelatine, cream, and Rouennaise ducks; these last are killed without loss of blood by puncturing the medulla, and are then beaten so as to effect the diffusion through their tissues of anything absorbed from the intestine. Certain fish, the herring and the conger, and certain roes are at times poisonous; mussels contain a poison which has been called mytilotoxine (Virchow and Brieger) and mytilocongestine (Richet), while oysters sometimes contain similar poisons. It is not known how these poisons are produced; by some (Thesen) it is thought that they are formed in sea water. Young veal is highly poisonous when the cow has suffered from septic fever or puerperal metritis. The meat of animals suffering from septic diseases, metritis, pneumonia, and typhus is undoubtedly poisonous. Hunted game is sometimes also poisonous from the intestinal microbes entering the blood.

Preserved meat, potted meat, sausages and the like, may be infected before being packed or during preparation, and in hot weather the microbes develop and produce poisons. Eggs may be contaminated in the oviduct, and when used in confectionery—especially when mixed with such favourable media for the cultivation of microbes as sugar, milk, and gelatine—may develop poisons. Cheese is also occasionally the seat of poisonous putrefaction.

There is little doubt that certain foods become poisonous from the absence of some principles normally present, but which have been removed or disappear when the food has been kept too long. Of these beri-beri, although only known to Western medicine in recent years, is the example in which this relation has been most clearly established. The belief that it depended upon some dietetic defect was maintained as long ago as 1878 by Wernich, supported later by Van Leent, and the practical value of the doctrine was demonstrated by Takaki, who, by the reform of the diet of the Japanese navy, wholly eradicated the disease from that service. But it was Braddon who was the first to show the connexion between the consumption of white rice and the prevalence of the disease, and the conclusive proof has been worked out by Fletcher, Stanton, and Fraser, who have shown that rice completely denuded of its pericarp, if used as an exclusive diet, causes beri-beri, while the disease may be prevented by mixing a proportion of the "cleanings" with the diet, and conversely that the disease does not arise when imperfectly husked rice is consumed.

Although the position of pellagra as a food disease is disputed, the belief is general in the United States, where its incidence has extended widely during the last few years, that this spread is due to the fact that maize, which was formerly consumed where it was grown, is now transported long distances and stored for use. The cases that have been observed in Scotland are also thought by some to be due to an analogous change in oatmeal.

Scurvy or scorbutus has been long recognized as related to insufficient diet, and should be included among diseases due to dietetic error or defect, for the suggestion that it is caused by a poison formed in tainted meat receives small support from the experience of those who have seen most of the disease. This view impressed itself upon the mind of Captain Robert Scott, as in the second year of his former Antarctic expedition, when he had plenty of fresh seal meat, the disease disappeared; but fresh meat contains the necessary principle. There is strong evidence of the value of varied diet, of fresh or preserved vegetables, and lime juice; the use of the last article coincided with the practical disappearance of the disease from the British navy.

Barlow's disease is another result of dietetic defect, as, like scurvy, it depends upon the want of some principle usually present in fresh milk but absent in patent and preserved foods. Cases have been alleged to occur in children who were fed on breast milk; but the breast milk may have been defective owing to the impaired health of the mother.

Speaking generally, the results of food poisons may be classified into slight, medium, and severe: (1) In slight cases there may be only some digestive trouble, nausea, vomiting, colic, headache, pain in the back, with recovery in two or three days, or there may be urticaria without digestive trouble, or simply diarrhoea. (2) In medium cases, in addition to the symptoms already described, there may be a persistently dirty tongue, slow convalescence, a disposition to relapse, accompanied by constipation and enfeebled digestion lasting for weeks. (3) Severe cases may present (*a*) the typhoid state, with high temperature, epistaxis, diarrhoea, gurgling in the right iliac fossa with enlarged spleen, such cases often giving rise to considerable difficulty in diagnosis; (*b*) the choleriform type, with violent vomiting and purging, pains, cramps, dyspnoea, thready pulse, sweating, purpuric and scarlatiniform eruptions, low temperature, collapse and perhaps death, or a reaction with return of diarrhoea and vomiting, followed by gradual improvement, slow convalescence, and prolonged weakness; (*c*) the icteric type, characterized by jaundice which may be malignant in form and results especially if the kidneys are diseased. Many doubtful cases of disease are due to these toxic infections.

Botulism is a special form in which, after two or three days of colicky pain, vomiting and diarrhoea set in with dryness of the skin and mucous membrane. There may be constipation. External and internal ophthalmoplegia may occur. There is no fever, but there is difficulty in deglutition owing to the dryness of the pharynx. These symptoms may gradually disappear and slow convalescence follow, or death may result from cachexia,

bronchopneumonia, or asphyxia from food sticking in the pharynx.

In Captain Ejnar Mikkelsen's book, *Lost in the Arctic*, which describes his adventures and hardships during his expedition to Greenland, he tells how, when hard pressed by hunger, he and his companion were driven to eat the liver of freshly-killed dogs, and suffered in consequence. Their symptoms were peculiar, as they consisted of an uncontrollable desire to sleep, their sleep lasting ten or twelve hours; when they awoke they suffered from a splitting headache; some days later the skin peeled, and Mikkelsen says his companion Iversen had "big sores all over his body." In an earlier part of the book it is stated that a dog was made ill by eating dog's liver, but somnolence was not a symptom. The livers, when eaten by Mikkelsen and his companion, were cut in slices and "fried in water," so that the meat was imperfectly boiled. The poison was probably toxic albumose, which was all the more active as the meat was freshly killed and only partially cooked.

Sir Lauder Brunton, Dr. A. C. Farquharson, and others have drawn attention to the symptoms produced by food poisons which in many cases resemble the action of a paralysing narcotic, but Farquharson attributes this effect, not to a direct soporific poison, but to dilatation of the gastro-intestinal blood vessels with consequent anaemia of the brain.

Many skin eruptions are attributed to the absorption of intestinal poisons—for example, erythematous rashes, urticaria, pemphigus or pemphigoid eruptions, and pruritus. The effects of fish, shellfish, and certain fruit in causing erythematous eruptions are well known. Coffee may cause pruritus and sweating of the palms of the hands and soles of the feet. A hospital patient had many recurrent attacks of herpes iris, with large bullae in the mouth and pharynx and over the elbows and knees, which invariably followed a bout of beer drinking.

Cyclic or periodic vomiting, or food fever, is a condition which occurs in childhood, from the second or third year onward up to puberty, and is attributed by most writers who have concerned themselves about it to disturbances of digestion, especially the digestion of carbohydrates. It does not always cease at puberty or at the age at which puberty generally occurs. A case of this kind, under my care a few years ago, was a lad of 18, as undeveloped as a boy of 12; he weighed only 4 st. 9 lb.; his attacks of vomiting occurred every few weeks, and were accompanied by severe headaches; he was quite unable to earn his living. At the urgent request of his father his abdomen was opened and gastro-enterostomy was performed, without any definite condition being discovered or any improvement resulting. Acetonuria has been observed in this affection, but there is little likelihood that the cause is acetone poisoning.

It is doubtful whether there is any sound foundation for Nothnagel's view that certain cases of infantile marasmus, cachexia, and pernicious anaemia result from atrophy of the intestinal mucous membrane. It is possible that pernicious anaemia may result from the absorption of poisons from some part of the alimentary tract which destroy the blood, but the atrophy of the stomach or intestinal mucous membrane is probably associated or secondary (Knud Faber). The relation of pernicious anaemia to intestinal intoxication, although possible, has by no means been proved, and Schmidt says he has not met with sufficiently severe fermentation or putrefaction to support this theory. Chlorosis and leukaemia have also been attributed to intestinal intoxication, but without any adequate proof, and there are now few persons who would support Sir Andrew Clark's view that chlorosis is due to intestinal poisons, and may be cured more efficiently by purgatives than by iron.

Certain affections of muscles may result from severe digestive disorder, as in the cases of polymyositis acuta described by Senator and Albu.

Oxaluria or oxalaemia may be fairly reckoned to be of alimentary origin, for oxalic acid is introduced preformed in the food, or is the product of carbohydrate fermentation in the stomach which may occur when the hydrochloric acid is deficient; hence the old Edinburgh treatment by nitro-hydrochloric acid is well founded.

Arterio-sclerosis is one of the conditions attributed to auto-intoxication, but the argument seems to be that, as only a small percentage of cases give a Wassermann reaction, they are not all due to syphilis; and if not to syphilis they must be due to auto-intoxication (Aufrecht), which only shows how comprehensive this doctrine may become. Indeed, Combe makes it play the same universal part that others assign to uric acid, while Tissier, in an equally wide generalization, maintains that the decomposition of animal protein in the intestine prepares a favourable soil for the growth of all pathogenic bacteria, and is therefore the source of most diseases.

It is sufficient comment on these theories to say that, however plausible, they do not rest upon a solid foundation.

Poisoning by Faecal Stasis.

It is tolerably certain that there is little evidence in favour of the popular notion that mere faecal retention favours the production in the bowel of fermentative or putrefactive changes giving rise to poisons which are absorbed into the blood and cause various pathological symptoms.

Simple constipation does not lead to any increase of decomposition in the faeces, and infrequent evacuation of the bowels is consistent with perfectly good health and longevity. But it is a not uncommon cause of chronic intestinal catarrh which may go on to ulceration and even perforation, and it is to these inflammatory consequences that must be attributed the various symptoms which are associated with constipation. Faecal retention is not inconsistent with a daily action of the bowels, as in a case reported by Mannaberg of a public official who asserted most positively that he had always made a point of getting a daily evacuation, but who died of perforative peritonitis caused by a large number of enormous faecal masses nearly as hard as stones.

While, therefore, we may be reasonably sceptical about "copraemia," "faecal fever," and other alleged results of faecal fermentation or putrefaction, nothing is more certain than that many symptoms may result from constipation where alterations in the wall of the bowel have taken place. Nor is it inconsistent with this view that thorough emptying of the bowel should be followed by temporary relief to these symptoms, but at the same time we should expect that the simple evacuation of the pelvic colon would not effect a cure.

Without inflammatory changes the natural protective agencies existing in the alimentary canal can keep us safely from such toxins as are formed in the bowel; so long as the several organs concerned are structurally healthy the intestinal contents are practically outside the body and are powerless to injure us.

Protective Agencies.

Against the long catalogue of supposed evil influences of intestinal microbes and toxins must be set the very real protective agencies by which under physiological conditions their entrance into the circulation is prevented. The general harmlessness of pathogenic microbes and their toxins in the digestive tract is supported by strong evidence. The healthy mucous membrane presents such a barrier by its relative impermeability that their diffusion takes place slowly, and time is allowed for the action of the digestive secretions which destroy the microbes and neutralize the toxins. This action is effected most efficiently in the stomach and small intestine, less so in the large intestine and rectum; but dogs and rabbits can withstand the rectal injection of cultures of diphtheria and tetanus, of which a fractional dose would be fatal if injected under the skin or into the circulation. Mere quantitative variations in the amount of the digestive secretions do not appear to interfere with this protective action, but in *achylia* infective microbes and toxins are not destroyed in the stomach, and pass rapidly into the duodenum. Even here they have to run the gauntlet of the pancreatic and intestinal digestion, which possesses almost equal destructive and neutralizing properties.

The bile has a much weaker action, its antitoxic effect being apparently due to its saponifying power as an artificial solution of soda palmitate possesses the same antitoxic coefficient. Roger attributes the antitoxic action of the bile to its power of modifying pathogenic bacteria so

that they no longer secrete toxins; but he maintains that so far from neutralizing toxins already formed, it actually increases their toxicity. Should these poisons enter the portal circulation, in spite of the destructive neutralizing or attenuating effects of the digestive secretions and the barrier of the mucous membrane, the liver itself possesses the power of arresting poisons or of converting them into harmless or less poisonous substances. Further, the intestinal mucus which coats the lining of the bowel delays absorption and prolonged contact with the mucous membrane neutralizes toxins.

Finally, the ordinary intestinal microbes are able to neutralize the toxins secreted by allied species and can inhibit the putrefactive power of others, while they can also neutralize toxins although to a much less extent than the digestive juices.

Inflammation of the mucous membrane of the bowel favours the absorption of toxins and its permeability seems to be normally greater in infants and young animals as shown by experiment. It is claimed that diphtheria antitoxin may be administered successfully to infants by rectal injection (Chantemesse) and that other antitoxins and vaccines may be so employed.

Further, it is found that various vegetable toxalbumens are not completely destroyed by the digestive juices but diffuse through the intestinal wall into the blood, and it is said that tuberculin differs in this respect from the other microbial toxins, behaving like these toxalbumens.

TREATMENT.

The treatment of these conditions cannot be discussed in detail, but the principles may be laid down.

In the first place, it is essential that food should be wholesome, that articles of doubtful nature should be avoided, that preserved foods, especially animal foods, should not be eaten when fresh can be obtained, and that as far as possible all food should be prepared by submitting it to cooking at a temperature of not less than that of boiling water. The eating of all uncooked food is attended by a certain amount of risk, and although we all run this risk at times it is unwise to eat such food when we know little about its origin or handling. For example, many English travellers suffer from eating fruit and salads in hotter countries, and even at home oysters are justly shunned unless we know their source.

In the second place, all food should be eaten slowly, properly masticated, and mixed with saliva. Defective teeth should be repaired or replaced, and the mouth kept in a healthy condition.

Provided these conditions are all fulfilled the stomach, if healthy, may be trusted to perform its share, but no doubt Trousseau's traveller was right who concluded each meal in strange places by taking a few drops of hydrochloric acid to reinforce the action of the gastric juice.

By all means let the diet be a mixed one of carbohydrate, protein, and fat, and consist of such things as are suited to the individual, avoiding excess and remembering that while every stomach can digest small quantities of most things no stomach can digest large quantities of everything. In youth amounts of food can be assimilated with advantage that in middle age tend to obesity and gout, and in later life to disordered digestion and many evil consequences. Moreover, mode of life must be allowed to regulate the quantity of our food, and as we become less active we should eat less.

Alcohol should be regarded with doubt and suspicion, for, while capable of conferring a certain amount of pleasure and at times of promoting appetite and even digestion, its general effect is to slow the digestive process and in large quantities to check it and to inhibit those protective agencies upon which our safety depends.

While due time must be given to meals and resting afterwards assists digestion, daily exercise favours absorption, maintains the circulation of the blood and lymph, prevents constipation and promotes elimination by the lungs and skin.

When alimentary toxins have been absorbed and passed into the circulation, the most rational treatment would be the administration of an antidote if we possessed one; failing that, we should try to prevent the further formation of poisons, and to favour their elimination.

Nature endeavours to get rid of the poison by setting up diarrhoea, vomiting and sweating, more rarely by diuresis, all of which may be imitated, guided, or controlled.

The means by which we may endeavour to provoke the prevention of the further formation of poisons and the destruction and elimination of those already present may be by (A) cutting off the supply of material; (B) reinforcing the digestive juices; (C) bacterial action; (D) drugs; (E) hydrotherapeutics.

A.

We seek to cut off the supply of further material for the formation of poisons by simplifying the diet. In acute conditions, after washing out the stomach, we may give nothing but hot water, or the same with the addition of a little milk or milk diluted with lime water, soda water, or barley water; in subacute and chronic conditions it is best to rely on lacto-farinaceous diet. As a general rule eggs, milk, and cheese are allowed, but some forbid even these, and give only vegetable protein, carbohydrates, and fat (Tissier). In all cases it is better that the food should be varied, well cooked, and moderate in quantity.

Fasting is a perfectly sound method of diminishing toxins if combined with copious draughts of water or mineral water (Guelpa).

Fruit "cures"—such as the strawberry cure that enabled Linnaeus to get rid of his gout, the grape cure and the like—probably act partly as fasting cures, partly by supplying a non-toxic and moderately purgative diet. The advice of Albu to take the juice of two or three fresh lemons three times a day, and to abstain from milk and fatty food, is based on similar principles.

The so-called Salisbury diet, which consists of three small meals of finely minced lean meat, each followed at an interval of two hours by half a pint to a pint of hot water, is a starvation diet, and acts probably very much like fasting, while the hot water promotes elimination.

Schroth's dry diet is also a cure by inanition, but the rational basis of the plan in all its details is not apparent, as after four or five days' abstinence from all drink and all food except five or six small dry rolls, the patient is encouraged to take a litre or a litre and a half of light wine, which, as might be expected, often causes intoxication; but the results of the Lindewiese cure, as reported by a recent observer (F. Sandoz), are on the whole not unfavourable.

B.

Physiology teaches us how to stimulate the secretion of the various digestive juices as the whole series depends for its efficient working on the proper initial start. Careful mastication not only divides the food mechanically and mixes it with the saliva, but stimulates the salivary glands to secrete and the saliva in turn provokes the flow of gastric juice and this the other secretions. Therefore the habit of hasty eating and imperfect mastication from any cause may impair the whole process of digestion, while conversely due attention at this stage is calculated to ensure the complete carrying out of the entire function. As we have seen that these digestive agencies are the most powerful means we possess for destroying or neutralizing alimentary toxins, the importance of this point can hardly be exaggerated, although to chew food until it is tasteless and remove the residue from the mouth, as recommended by Mr. Fletcher, goes beyond what is reasonably necessary.

C.

We have seen that the ordinary intestinal bacteria afford a protective agency which, although weaker than the digestive juices, checks the action of putrefactive and pathogenic bacteria and neutralizes the toxins formed by them. Of the ordinary bacteria which play this useful part the best known is the lactic acid bacillus—a normal inhabitant of the intestine which has been made famous by Metchnikoff, but the value of butter-milk in remedying the results of a debauch has long been known in the North of Ireland. Bulgarian sour milk or Yoghourt when properly prepared is a pleasant article of food which promotes the normal action of the bowel, and the use of this or of butter-milk should be encouraged.

D.

As the stomach is the place where the food first rests and remains longest, it possesses the most efficacious antitoxic properties. The healthy stomach is sterile, and all food during its stay within its cavity is sterilized as a result of peptic digestion, and this is carried out in the presence of sufficient hydrochloric acid and pepsin. Pepsin is deficient in only the rarest instances, but the supply of hydrochloric acid may be defective or altogether absent. Under these circumstances the administration of hydrochloric or nitro-hydrochloric acid is indicated, but should be in larger doses than those commonly administered. Ten or fifteen drops of hydrochloric acid (*B.P.*) may be added to half a pint of sweetened water, and this quantity used as a drink during or after each meal. Mercurials, especially blue pill or calomel, act as antiseptics in the stomach and duodenum, but most of the so-called intestinal antiseptics have not justified the claims made for them, and it is doubtful whether any antiseptic drug in practicable doses can preserve its bactericidal capacity after passing a short distance down the intestine.

Purgatives unquestionably eliminate toxins, and are among the most powerful means we possess, but many act only on the pelvic colon and rectum, and do not clear the whole length of the large intestine. Senna possesses this valuable property, and one of the best aperients for chronic faecal stasis is an infusion of senna pods taken every night at bedtime.

E.

The practice of drinking large quantities of water, especially of the milder mineral waters, has much in its favour. Unmineralized water is apt to stay in the stomach and so to cause discomfort, but this does not seem to be true of hot water, which many people take on rising and again at bedtime. Small quantities of salines, especially magnesium chloride or sodium phosphate or sulphate, may be added to the water with advantage. This helps elimination by preventing the drying of the faeces in the colon, and stimulates peristalsis. To ensure complete evacuation of the large bowel irrigations or ascending douches are among the most efficient means, but there is a risk of inducing atony of the bowel when their quantity is excessive or their use is continued too long. The "entero-cleaner" of Anton Brosch is the most elaborate of ascending douches, the chief advantage claimed for it being that, as it is administered under water, the external pressure supports the bowel and prevents over-distension. When the above described methods have had a fair trial, and there is reason to believe in serious pathological changes in the colon permitting the continued absorption of toxins, its exclusion or removal should be considered.

Conclusions.

1. Under physiological conditions the natural protective agencies in the alimentary system are sufficient to shield the body from the dangers of poisons formed therein or of those introduced with the food, provided that these are not in overwhelming amount.

2. Infrequent or incomplete evacuation of the colon is not in itself a cause of disease.

3. Such morbid symptoms as arise result from a breakdown in the protective machinery, in consequence of functional defects or pathological changes in the organs concerned.

4. Wholesome food in reasonable quantities may consist of animal or vegetable protein, carbohydrates, and fat in due proportion, and the evidence does not justify the entire exclusion of animal protein, as being directly or indirectly the cause of toxaemia.

5. When toxaemia is present treatment should be based on the principles of eliminating the poison already present, preventing any further introduction and reinforcing the natural protective agencies.

6. Where there is extensive disease of the wall of the colon the exclusion or removal of this organ is a justifiable proceeding after a reasonable trial has been given to medical methods.

CONSEQUENCES AND TREATMENT FROM A SURGICAL POINT OF VIEW.

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I will endeavour to give a brief summary of the surgical treatment of the autointoxication and other effects which result from chronic intestinal stasis. The causation of stasis and the consequent infection of the gastro-intestinal contents are due to improper feeding in early life, and subsequently to the prolonged assumption of the erect posture of the trunk.

The changes that result in the drainage scheme are evolutionary in nature, and simply mechanical in origin. To meet the tendency to downward displacement of the viscera which results from an accumulation of faecal matter, at first in the large intestine, and later in the small intestine and stomach, membranes or mesenteries develop. These bands represent the crystallization of resistances. They form, in the first instance, as thickenings on the peritoneum, and later as distinct membranes or mesenteries, which support the viscera and tend to obviate their prolapse. Some observers regard these new developments as being congenital in origin, while others consider that they are inflammatory products. Against both these hypotheses are the facts that they do not exist at birth, that they can be seen in every stage of development during the lifetime of the individual, that they vary distinctly with occupations, that they commence at that point in the mesentery which is most distant from the bowel, and are obviously developed for the purpose of securing that particular portion of the intestine more closely to the abdominal wall, that they appear only on one surface of the mesentery, and that surface is the one along which the greater amount of strain is exerted, and that they correspond exactly in situation and direction to the lines of force. Besides this, they occur in the layers of peritoneum in which the main lymphatic trunks do not run, while they do not develop on such peritoneal surfaces as are chiefly in relation with the lymphatic glands and vessels.

At their commencement they serve a useful purpose. Later they tend to impair the function of the part and consequently to shorten life. This is a common characteristic of such evolutionary changes as develop during the lifetime of the individual.

While the effluent through any portion of the intestine may be controlled by some mechanical means applied externally, as, for instance, by a band, membrane, or appendix, the contents of the intestine may also be dammed back merely by the accumulation of material in the bowel beyond. This is illustrated by the puddling and obstruction in the much elongated pelvic colon seen so frequently in tuberculosis and rheumatoid arthritis in young people, and again in the delay of the contents of the ileum, and their consequent infection when material is accumulated in a large dilated caecum occupying the true pelvis, or occasionally when the caecum is fixed immovably in the iliac fossa. In any case the result is the same—namely, stagnation of the intestinal contents and the changes consequent on such delay.

The result of this stasis of the intestinal contents manifests itself in two distinct ways, which may or may not be obviously associated clinically. The mechanical results of such delay in the small intestine are interference with the effluent from the duodenum and consequent distension changes in the duodenum, more especially in its first part. This obstruction produces engorgement of, and later inflammatory changes in, the mucous membrane of the bowel, and may finally cause ulceration and perforation, or cicatrization and stenosis of the first part of the duodenum. Spasm of the pylorus follows on distension of the duodenum, and this brings about dilatation of the stomach with hypertrophy of its walls. Because of the strain exerted by the heavy contents of the stomach, often increased by the weight of an habitually loaded transverse colon, engorgement, inflammation, ulceration, and finally cancerous infection of the mucous membrane may develop along the lesser curvature at the site of greatest strain. This area of excessive tension approximates to the

pyloric end but varies with the position of the liver. Spasm of the lower end of the oesophagus occasionally complicates this condition and material may accumulate in the oesophagus. The term "cardio-spasm" has been applied to this condition, which exists in very varying degrees of severity and intermittency. Its symptoms and treatment have been fully described by Dr. Plummer. The alteration that takes place in the contents of the stomach and small intestine, due to their infection by organisms and consequent chemical changes, produces a quantity of gas, etc., and this determines the symptoms which are grouped under the comprehensive term "indigestion."

The ducts of the pancreas become infected by the direct extension of organisms along them, and induration, inflammation, and cancer of that organ may result. Similarly in the case of the liver, gall stones are developed with all the troublesome sequelae of their presence, the last of which is too frequently cancer. The infection of the ducts may extend up into the liver and inflammation of that organ may result.

Besides the mechanical changes in the gastro-intestinal tract and in the ducts which open into it, the chief trouble consequent on the stasis is the autointoxication produced by the absorption from the gastro-intestinal tract, and especially from the small intestine, of a greater quantity of toxic material than the liver and kidneys can deal with. This autointoxication produces a degeneration of every tissue in the body. It is particularly manifest in the organ which converts the poisons, in the heart and vessels which convey them, and in the kidneys which excrete them. The effect of the poisoning is shown especially by a loss of fat and by a degeneration of all the muscular tissues of the body. These factors are of especial importance in the female, whose function of accommodating and transmitting a fetus renders her more liable to change in consequence. The outline of her body is lost because of the dropping of the breasts and abdomen and the wasting of the buttocks. The uterus becomes soft and heavy and bends about. It drops backwards in most cases, so that the gorged heavy fundus rests on and tends to obstruct the rectum. The kidneys, being no longer cushioned in fat, prolapse, as do all the other viscera of the abdomen. In this manner a vicious circle is set up, by which the stasis and consequent autointoxication are still further exaggerated. Thus a condition of premature senility is brought about. The skin becomes thin and stained and its secretion frequently offensive.

The breasts undergo degenerative changes, manifested in the first instance as induration, to be followed by inflammatory and cystic degeneration, and possibly, lastly, by cancerous infection. The thyroid may enlarge, form tumours, and symptoms of exophthalmic goitre may not infrequently develop. The circulation is much affected. In some cases the blood pressure is abnormally high when it is associated with pretty obvious changes in the heart and aorta, while in others it is subnormal. The general body temperature is subnormal, whereas that of the extremities is always so, sometimes in such a marked degree as to suggest Raynaud's disease.

Microbic cyanosis may also be present.

The cerebro-spinal system is affected in a very marked manner by the poison. The patient is always depressed, feels stupid and unfit for physical or mental exertion, and suffers from headache which varies in character and intensity. Neuralgia or neuritis are frequently complained of. The sufferer sleeps badly, tends to fall asleep at all times of the day, dreams greatly, and awakes from sleep without feeling refreshed. These and other symptoms may exist in any degree of severity. In some cases the individual is mentally so dull as to appear imbecile, while in others the misery is so great that the patient willingly resorts to drugs, drink, or suicide as the only available means of alleviation or freedom from suffering. The eyes are definitely affected in many ways from the autointoxication. The condition of the conjunctiva is characteristic of its presence and degenerative changes in the tissues of the eyes are brought about. The sense of hearing also becomes defective in some cases, probably on account of degeneration in the nerve tissue or of infection in the spaces in connexion with the middle ear. The resisting power of the tissues to the entry of organisms is lowered. The effect of this is seen, perhaps, most commonly in the sockets of the teeth, and especially around the lower incisors. Organisms establish a foothold in the gum about the fang, and produce a condition of inflammation which may sooner or later destroy the teeth. The products of suppuration from the infected gums being swallowed increase the infection of the upper portion of the gastro-intestinal tract, and seem to aggravate the general depression. A similar infection may occur in the sinuses and lymphatic tissues about the nose and throat. The genito-urinary tract of the woman is particularly liable to infection, and innumerable troubles affect her in consequence and interfere with the satisfactory performance of her functions. These patients readily develop tubercle or rheumatoid arthritis. I do not believe that these diseases can exist except in the presence of autointoxication. The evidence in favour of this statement is that these cases invariably show very definite clinical and *x*-ray evidence of stasis, and that the symptoms disappear and the patients recover sometimes with startling rapidity when the condition of stasis has been effectually dealt with. I would remind you of the remarkable confirmation of the extreme importance of effective drainage which Carrel's experiments afford. He has shown that tissue is immortal provided that it is properly drained, and that it obtains sufficient food. The difficulty that has to be met by us does not lie in the supply of sufficient nutrition, but in dealing with the defective state of our drainage apparatus. Carrel's observations are of the greatest possible service at the present moment, since they afford us the same confidence in our methods of treatment that *x* rays did in the case of operation for simple fractures, when the opposition to that form of treatment was intense and to a great extent unscrupulous in its methods. If we wish to deal with primary causes and not merely with effects, it is our business in all cases of autointoxication resulting from intestinal stasis to improve the drainage of our bodies so that material is no longer allowed to stagnate, decompose, and poison our patients. We cannot now pursue obsolete methods and be satisfied with the treatment of end results. We must deal with the defective condition of the intestines, the prime factor in the development of disease and death. Whether this can be effected sufficiently by the use of lubricants, abdominal pressure and diet, or whether some operative treatment is required, must depend on the nature of the stasis and the condition of the patient. Here again *x* rays afford us very great assistance, since they indicate not only the rate of passage of the contents through the several portions of the tract, but they often demonstrate the exact nature of the obstruction. Besides this, they show many of the changes in the heart and aorta, which are often serious complications of autointoxication.

In the vast majority of cases the ileal effluent is at fault. Sometimes this can be met by the removal of an appendix controlling the passage of the ileal contents into the caecum, or by the division of a membrane or a ligament reducing the lumen of the last two or three inches of the ileum, while at other times the best result is obtained by fixing the divided ileum into the pelvic colon, and by exaggerating the last kink by means of a suture, so as to avoid the ascent of faecal matter into the iliac colon. This last method of treatment is by far the most efficient, and results in immediate benefit in the vast majority of cases. Within a few hours of the operation the patient asserts that she is quite different, and that she has lost that feeling of intense misery and depression from which she had suffered for years. The feel of her hands, etc., is altered, and she looks a greatly improved woman. In a certain proportion of cases it is advisable to remove the large bowel at the same time or subsequently. This is particularly called for when the condition has existed for a long time and there is much change in the large intestine. The only risk of these operations is that common to all abdominal operations—namely, the formation of adhesions, which may anchor or obstruct the lumen of pieces of small bowel. This can be best prevented by rigid asepsis, and by avoiding exposure and manipulation of the intestines, and by approximating the edges of peritoneal surfaces as accurately as possible. It is now too late for mere quibbling, and for the negation of facts that are perfectly obvious and capable of demonstration in the clearest manner possible. This condition of defective

drainage has already been dealt with by surgeons all over the world, as well as by myself, and those who have had a large experience in the operative treatment of these cases are arriving at definite conclusions as to the best mode of dealing with them. Chronic intestinal stasis is a subject that is growing very rapidly in importance, and it cannot be decided merely by conjecture or on previous experience, but by the light of hard facts as afforded by the results of operative interference.

The Goulstonian Lectures

ON

DEATH BY ELECTRIC CURRENTS AND BY LIGHTNING.

Delivered before the Royal College of Physicians of London.

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Lecture III.—DEATH BY LIGHTNING.

Having discussed the subject of death by industrial electric currents very thoroughly in the last two lectures, I am in a position to approach the obscure subject of death by lightning-stroke with the more confidence. This form of death is much commoner in most countries than it is in ours. In England and Wales the Registrar-General reported 124 fatal instances of lightning-stroke, 108 in men and 16 in women, during the ten years 1901–1910, a yearly average of only 12.4 deaths, or 0.36 per million living. In the twenty-nine years 1852–1880 there were 546 such deaths, the yearly average for that period being 18.8, or 0.88 per annum per million living. The number of these deaths varied widely in different years; three people were killed by lightning in 1863, 46 in 1872. The annual death-rate from lightning also varies widely in different parts of England. In the North Midlands from 1852 to 1880 it was 1.8 annually per million living; in the metropolitan district only 0.13 (Lawson)—a figure that should be of comfort for anybody who is in London during a thunderstorm. On the Continent much higher yearly death-rates are found. In Hungary the annual death-rate from lightning is said to be sixteen per million living (Milham); in Styria and Carinthia about ten per million, in Prussia 4.4, in France and in Sweden three, in Belgium two, so far as the imperfect statistics available go (McAdie and Henry). In the United States of America the annual death-rate per million is high, about ten, in consequence of the frequency of thunderstorms on the one hand and of the large percentage of the inhabitants engaged in outdoor labour on the other; about 700 or 800 deaths from lightning were estimated to occur in the United States every year by Henry in 1900, in a population of 76 millions.

Many more people are struck by lightning than are killed. For example, Jack records an instance in which a church was struck; 300 people were in it, 100 were injured and mostly made unconscious, 30 had to take to their beds, but only 6 were killed. Weber gives an account of 92 people struck in Schleswig-Holstein; 10 were killed, 20 paralysed, 55 stupefied, and 7 only slightly affected. In 1905 a tent with 250 people in it was struck, and 60 were left on the ground in various states of insensibility; one was killed outright, another breathed for some minutes before dying, the rest recovered.[44] As many as eleven [81] and eighteen [87] persons have been killed by a single stroke of lightning. Vincent mentions a stroke that threw down 1,200 and killed 556 out of a flock of 1,800 sheep. Dechambre believes that children are perhaps less liable to be struck than adults; but statements such as these are really not capable of proof or disproof.

The Nature of Lightning.

Nothing was known or even, apparently, guessed as to the true nature of lightning and its connexion with electricity till 1708, when Wall drew attention to the similarity between it and electric sparks obtained by rubbing a piece of amber. The identity in kind of electric sparks and lightning was proved in 1752, when the experiment suggested by Franklin in 1750 was carried out in France by D'Alibard, and ordinary electric sparks were obtained, during the passage of a thunderstorm, from an insulated iron rod forty feet high set up in a garden at Marly-la-Ville. A few months later Franklin proved the same thing by his celebrated experiment of flying a kite up into a thunder-cloud during a rain-storm, and drawing sparks from the wet cord that held the kite. In this way it was proved that a flash of lightning is no more than a particularly large and powerful electric spark.

When electric sparks and their methods of production are examined, it is found possible to determine a large number of physical data about them—the voltage that is required to produce a spark of a given length, for example, the duration of a spark, the direction of its flow, the quantity of electricity (measured in coulombs) it contains, the rate of flow in amperes of the current that produces it, the amount of energy (measured in joules) expended in its production, and the rate and number of the oscillations composing it—for in a great many cases an apparently simple and single electric spark is really a complex built up of a rapid succession of sparks of diminishing intensity, first in one direction, and then back again in the opposite. All these measurements can be made with some accuracy, and many of them are of importance in determining the lethal or non-lethal effects of electric sparks upon animals.

But with lightning flashes the dangers of such investigations as these are obvious, and not one of the measurements just described above has ever been made as yet with any approach to accuracy in the case of lightning. One only has a number of vague suppositions and a few somewhat sketchy experimental facts to go upon. Still, such as they are, these are worthy of consideration.

1. *Voltage.*—This has never been measured, but has always been assumed to be very high. Lodge calculated that the production of a flash a mile long might require a difference of potential of five thousand million volts, and reckons the difference of potential concerned in an ordinary flash at millions or hundreds of millions of volts. Most authors content themselves with saying that the voltage of a flash must be millions or many millions of volts. Trowbridge found that his battery of twenty thousand small secondary batteries joined up in series gave him initial sparks 3.5 to 4 cm. in length, at a voltage of about 40,000 volts; but, when the two sparking terminals were quickly drawn apart, he could get a flaming discharge 60 cm. in length. He also found that the apparent resistance of the air was much diminished, and the sparking distance at any given voltage was increased, when large quantities of electricity were employed and transmitted in the spark.

2. *The quantity of electricity in a flash*, in coulombs, never has been measured. Faraday believed that it was quite small, not enough to decompose a drop of water into oxygen and hydrogen, and later writers have agreed with this estimate. Lodge, for example, mentions seventy coulombs as the quantity in a certain flash, enough to decompose only one-tenth of a grain of water.

3. *The amperage*, or rate of flow of the electricity, has always been assumed to be large. Here, at last, we meet with a quantity that has been measured, though not by a method capable of very accurate results. Pockels has described some experiments made with the lightning flashes that struck lightning rods on an observatory in the Apennines; and from the amount of permanent (remanent) magnetism induced in some small basalt prisms by the current flowing down the lightning conductor when it was struck, he has calculated that in these particular lightning flashes the current was from 11,000 to 20,000 amperes. Trowbridge's view that with sparks of large amperage the resistance of the air seems to be reduced has been mentioned already.

4. *The duration* of lightning flashes has not yet been investigated as carefully as it ought to be; it is a matter for the meteorologists to settle by actual observations. Schmidt's experiments showed that the duration of many flashes was under $\frac{1}{5000}$ second, while others were multiple or oscillatory in character, and lasted for $\frac{1}{1000} - \frac{1}{2000}$ second, and yet others lasted for longer than $\frac{1}{200}$ second.

Flashes passing from one cloud to another high in the air may last for as long as one second, according to Hann. Lodge, on the other hand, assumes that a single flash lasts for "some extremely small fraction of a second, say $\frac{1}{100000}$ or thereabouts," and so does Sylvanus Thompson.

5. *Direction and Course.*—A clearly-seen flash of lightning gives one the impression that the flash starts at one end and runs rapidly to the other end of its course. There is no reason to suppose, however, that what one sees here has any relation to the reality. A lightning flash is generally over in so small a fraction of a second that the retina has no time to form any accurate judgement as to which end of the flash began first; such impressions really depend upon the unequal sensitiveness of different parts of the retina to light. Meteorologists calculate that two-thirds of the flashes first run, as a matter of fact, from the earth to the clouds (Mache and von Schweidler). One's eye is equally deceived as to the course taken by the flash in a great number of cases, as is shown by the many published photographs of lightning. These photographs prove that most flashes are multiple, meandering, and branched, and quite unlike what the eye sees. The tendency of lightning to send off branches or side-flashes at points where it changes its course has been illustrated and reproduced in the laboratory experiments of Trowbridge; who also draws attention to the explosive force that seems to be exerted at the points where either lightning flashes or electric sparks of large amperage change their direction.

6. *Oscillatory Character.*—Lodge has brought forward theoretical reasons for supposing that a lightning flash is an oscillatory discharge like that of a Leyden jar, and not a single rush of electricity; in other words, an alternating and not a continuous current of very brief duration. His view seems to be generally accepted, though not universally (Mache and von Schweidler). These oscillations would have an enormous frequency, possibly millions a second, according to Lodge; Emde has made elaborate calculations to prove that the frequency may be much less than this, and that the number of alternations may be only from 2,000 to 8,000 per second. Many of the photographs of lightning taken with a moving camera prove that what appears to the eye a single flash is built up, in reality, of a succession of flashes, travelling along the same path or closely similar paths (Milham).

7. *The Energy in a Flash.*—This has never been measured; but judging by the very violent disruptive or explosive effects of some flashes on such things as rocks and trees, it must be very great. Lodge calculates that the discharge from as little as an area of ten yards square of a cloud fully charged with electricity at a height of a mile would give a flash of over 2,000 foot-tons energy, or 101,000 joules—enough to convert about 40 grams of water at 18° C. into steam at atmospheric pressure. The energy in a great many lightning flashes must be very much larger than this.

Particular attention must be drawn to one feature of lightning flashes that distinguishes them from the ordinary industrial currents of electricity. Given a choice of several alternative paths to travel along, ordinary industrial currents travel along them all in quantities directly proportional to their conductances, or, as it is more usually put, inversely as their resistances. But the very brief alternating current got by discharging a charged Leyden jar behaves quite differently; for it will leave a good conductor such as a coiled up thick copper rod in order to spark across an extremely badly conducting air-space, preferring a path of low self-inductance (or low impedance) to one of low resistance. The same is true of lightning, as was first emphasized by Lodge; it explains the tendency of lightning to send side-flashes out of good conductors like lightning-rods into any objects near by, and the frequent failure of such rods to protect the buildings on which they are fixed from damage by lightning.

Classification of Lightning Flashes.

Seneca (died 65 A.D.) distinguished three varieties of lightning—the penetrating, the shattering, and the burning. His classification persisted more or less until Arago offered a new system, and wrote of the forked, sheet, and ball lightning, with which we are all familiar. But for scientific and practical purposes[70] lightning flashes are now divided into two varieties—the A flashes and the B flashes of Lodge. The A flashes are the less sudden and less violent variety, and protection against them can be afforded by lightning-rods; they correspond to the "cold lightning" of the Germans. The B flashes are more sudden and violent, very destructive in their effects, and they contain a far greater amount of energy to be dissipated than the other variety; they correspond to the German "burning lightning," and often cause disastrous fires. No system of lightning-conductors will protect against them. Both varieties may be fatal to man. In all probability ball lightning is the result of a B flash striking the ground; it is a rare and very striking form of lightning. For some reason that I have not been able to fathom, medical writers who deal with lightning devote a great deal of attention to the "return strokes" of Mahon (1780) and Tyndall.[169] These have been rehabilitated by Lodge, who explains them as oscillations and overflows of electricity induced by the original flash; he describes them as electrical echoes, so to speak, due not to a statical disturbance of equilibrium as was at first supposed, but to induction and electro-magnetic inertia. Such induced flashes might be fatal to man, but there is no evidence to show that as a matter of fact they often are thus fatal; they are described by Vincent as "lateral flashes."

Theories of Death by Lightning.

This has long attracted the attention of the human kind. Lightning is represented by weapons of destruction in the oldest records of it that we have—the seals, cylinders, and bas-reliefs (dating from perhaps three or four thousand years B.C.) found in the ruined cities about the Tigris and Euphrates,[90] a country where thunderstorms are common. The Greeks in the classical times took an optimistic view of death by lightning, arguing that Justice or Piety profited, though the victim, who might be buried with divine honours, perished; a non-fatal stroke was regarded as a sign of the favour of the gods. The Romans, contrariwise, took a gloomier view—considered death by lightning a punishment, and buried the victim without his just funeral obsequies; thunderstorms counted for a good deal in their science of augury, which seems to have been of great political service to the Romans. In literature and art the symbols representing lightning were borrowed from Zeus by Alexander the Great, as tokens of his own royal and divine power, and have been extensively so used since by other sovereigns; and one of them—the trident[68]—has now figured as such, on the reverse of our own bronze coinage, in Britannia's right hand, since the year 1797.

The ancients believed lightning to be generated in the clouds, either from the cosmic fire or from heat coming from the sun and the planets. Theories as to the way in which it caused death had no interest for them, and do not seem to have been formulated until much later. To quote a few early examples out of many, Janichius, writing in 1606, says that lightning kills man by very rapidly penetrating the pores and viscera of the whole body and changing all its parts very quickly, imbuing its fount of life—the heart—with a poisonous quality, and suffocating it with a sulphurous malice; or it may rupture the chambers of the heart by suddenly distending them with spirit and heat through fear. Kisling, in 1673, sets death by lightning down to the fire it contains; the fire rarefies the blood by its dilatatory force, dispels the nervous spirits, and stops the heart. Both these authors, it may be observed, arrive at the truth that death by lightning is often due to paralysis of the heart; but they get there through such a maze of erroneous reasoning and misstatement of fact that it is hard to give them much credit for the discovery on which they thus happened.

Very similar essays on death by lightning continued to be produced for, at any rate, the first two-thirds of the eighteenth century, and new modes in which such deaths might take place were elaborated by the impossible method of deduction. Thus Hoffmann, in 1703, asserted that persons killed by lightning died from want of air suitable for breathing, being asphyxiated by the quantity of sulphurous exhalations emitted by the flash. Röser (1704) attributed some of the deaths to a supernatural cause, the just judgement of God; others to such natural causes as the explosion of sulphurous and nitrous particles within the body caused by the flash, or to suffocation, or to injuries of the animal faculty or sense. Münnich (1732)

concluded that lightning killed either by expanding the air in and around the body and so preventing respiration, or else by causing a vacuum which made the blood give up its gases and tear the weaker blood vessels, particularly those of the brain or medulla, leading to the extravasation of blood and death. He supposed, in fact, that the proximate cause of death by lightning was deprivation of external air. Stock (1734) enumerated three possible causes of death by lightning—first, terror; secondly, suffocation by inhalation of the nitro-sulphureous particles left in the track of the lightning; thirdly, the sudden expansion of the aërial particles in the spirits and humours of the body, whereby the spirits were dissipated and the humours rarefied to such a degree that vital movement and respiration could no longer be carried on. Rasbach (1737) stated that death by lightning was brought about by the narcotic effects of the sulphurous effluvia of the lightning, which penetrated the lungs and intercepted life by abolishing their vital functions. Vollmar (1765) attributed it to suffocation and the consequent symptomatic apoplexy, or to fear, or to the vacuum produced by lightning, or the expansion of the air inside the body, or, finally, to the reduction of the body to ashes. Hoffmann (1766), in a very elaborate and carefully written thesis, concluded that the main cause of sudden death by lightning-stroke was some lesion of the nerves and brain, inaccessible to the senses and too delicate to be demonstrable. He went on to enumerate six ways in which the brain and nerves might be fatally affected by lightning, all of them speculative and fanciful, none of them actually observed. Marherr (1766) ascribed death by lightning-stroke to tearing open of the blood vessels in the lungs, comparing it to the deaths caused by the wind of cannon balls on fields of battle, when the victim is not actually touched by the cannon ball but is killed suddenly by the vacuum caused by its passage near him.

It was perfectly natural that all these new theories as to the cause of death by lightning should arise in the seventeenth and in the first half of the eighteenth century. Great advances were then being made in physical science on all sides, and it was only to be expected that van Helmont's discovery of the existence of different gases in 1610, that the wholesale introduction of chemical ideas into the art of medicine by de la Boë (Sylvius) in 1650, and that von Guericke's discovery of the air pump and methods of producing vacuums in 1652, should lead to well meant, if crude, attempts to explain death by lightning-stroke in the terms of the advancing sciences of chemistry, physics, or physiology.

But there was little hope of any real progress in the matter until some explanation of the nature of lightning itself should be furnished, and this was done by Franklin. A fairly efficient frictional machine had been invented by von Guericke in 1662, and had been much improved since; the Leyden jar for storing electrical energy was discovered in 1745 by von Kleist, and now that the identity in kind of frictional electricity and lightning had been proved, it became possible, and natural, after a time, to utilize experiments with frictional electric machines and Leyden jars to throw light on the mode of death by lightning-stroke.[2]

Andrew Gordon, a Scottish Benedictine monk teaching at Erfurt, seems to have been the first to try the effect of electricity on the lower animals with fatal results. His cylinder electric machine gave currents strong enough to kill chaffinches. In the next year, 1746, Gralath similarly killed beetles, worms, and birds; Nollet noted that on dissection these birds showed ecchymoses similar to those seen on persons killed by lightning. Similar experiments were made by a number of people in the various countries of Europe, particularly in France, Germany, England, and Holland, where much general interest was excited by the recent progress of electricity; for at this time and for many years to come the science of electricity, such as it was, formed an ideal field for the activity of the practical joker. The results of these experiments narrowed the field of causes of death by lightning, and it came to be recognized that several of the current views were untenable. Thus Bidermann, in 1768, discussed them all under five different heads, rejecting many of them—for example, suffocation by concussion or compression or rarefaction of the air, combustion, apoplexy, congelation of the animal spirits. He concluded that lightning kills by a sudden injury to the nerves of the brain, caused by the rapid movement of the electric material, which abolishes their function; he believed that the nervous fluid was identical with or very nearly related to the electrical fluid. Abildgaard three years later proved that this was correct, and that shock to the nervous system was at any rate one way in which electricity, and therefore presumably lightning, might bring about death. He also made the very important observation that fowls killed by electric sparks remained dead if left alone; but that they could be recalled to life by the passage of another electric discharge through them from breast to back.

Brodie, in 1828, expressed the view that in most instances lightning killed by destroying the functions of the brain, and advised that the persons struck should be kept moderately warm, and have their lungs inflated by bellows so as to imitate natural respiration; similarly Auzouy (1858) and Dillner (1865) both laid great stress on respiratory paralysis in certain cases of death by lightning-stroke. In contrast to these interesting experiments of Brodie's may be quoted the gloomy and also erroneous views of two anonymous writers in the *Lancet* of 1830 and 1831. One says that speculating upon the mode in which lightning operates in producing death would be a vain and useless discussion; the intensity of the electric action instantly annihilates all connexion between soul and body, hence all means of resuscitation are vain. The other states that when the body is struck by lightning, complete death ensues; in asphyxia of this kind no vitality exists on which to act, for organic and animal life are both extinct. Oesterlen, in 1881, ascribed such deaths largely to an uninvestigated change in the blood, perhaps in the juices of the body in general also. Boellmann, in 1888, put death by lightning down to mechanical violence in the form of what he called cephalo-rachidian shock applied to the central nervous system through the cerebro-spinal fluid; he supposed the fluids in the lymphatic sheaths round the vessels to undergo a sudden increase in tension, thereby producing anaemia of the nervous centres and abolition of the function of the nerves. The part played by the heart and the continuance or stoppage of its action after a lightning-stroke does not seem to have attracted much further attention till many years later, though they are undoubtedly very important. Dillner (1865) laid great stress on it, assuming that the heart went on beating after apparent death in all persons who had been struck by lightning and yet were capable of being brought to life again. Should the heart cease beating for more than a short time, recovery would be, he considered, impossible. B. W. Richardson, in 1869, as a result of his experiments with a large Apps induction coil and Leyden jars, similarly attached great importance to the heart's action here, and stated that recovery was impossible if the heart was paralysed; and that in all cases where it was instantaneous, death by electric shocks was due to the sudden expansion of the gaseous part or atmosphere of the blood, combined in extreme degrees of shock with a sudden conversion of animal fluid from the fluid into the gaseous condition. He gives no detailed record, however, of the discovery of any such liberation of gas in the vessels of animals killed by electric sparks, though his papers are full of detail on other points. Here again we have a theory evolved from the imagination of its author, and lacking experimental proof of any kind. Dürck, in 1895, writing at a time when a good deal more had been found out as to the modes of death by electricity, came to the conclusion that death by lightning was due to permanent paralysis of the cardiac or the respiratory nervous centres, caused by the passage of the discharge; and Pélissié's conclusion was very similar.

Post-mortem Lesions after Death by Lightning.

The lesions produced by lightning in fatal cases of lightning-stroke are of the most varied extent and description imaginable. One may begin a brief account of them by saying, *hibernicé*, that in a large number of cases no lesion whatever, either external or internal, may be found *post mortem*. Such cases are not at all rare, and have been recorded both in man and in domestic animals. Sestier, for example, found no external injuries in 19 out of 119 cases of death by lightning. The great

majority of victims show superficial burns and scorchings of various depth and extent. Most commonly the burns are of the first or second degree, in the form of streaks that are taken to show the paths followed by the lightning, or in the form of isolated spots or areas. Singeing of the hair growing on these burns is highly characteristic of lightning-strokes, and may take place either with or without any singeing of the clothes in contact with the burnt skin, and also without any burning of the skin itself. Usually the burns are in the shape of bands or ribbons of hardened, discoloured, parchment-like skin, running down the trunk or legs. A very exceptional case is recorded by Cipriano, in which there were burns of the second degree on the neck, chest, and leg, while practically the whole of the rest of the body showed a burn of the first degree; the patient made a slow and difficult recovery. Vincent quotes the case of a woman who was struck and received burns of the first to the third degree from head to foot, and died from exhaustion after six months' suppuration. Less often the burns go deeper, and may even char the underlying bones or the tongue (Clark and Brigham) or the abdominal viscera. In many cases the deeper burns heal readily, if the victim survives; but in others slow healing with much pain and suppuration have been recorded. Patches of hair and of skin may be quite torn off. Persons struck or killed by lightning are said to exhale a peculiar or characteristic odour, oftenest described as resembling the smell of burning sulphur or of ozone; other writers compare the odour to such various smells as those of nitrous fumes, gunpowder accidents, acid, dilute sulphuric acid, sulphuretted hydrogen, nitrous acid, ammonia, electric sparks, and lighting matches, and it has also been described as *sui generis*.

Very characteristic, or even diagnostic, of lightning-stroke are the so-called "lightning-figures" often seen on the skin in both fatal and non-fatal cases. These consist of reddish, brown, or purple discolorations of the skin, described in different instances as resembling such things as coral, fronds of ferns, branches of fir-trees, trees, palms, pieces of outdoor scenery, or even "in outline a perfect map of North America, all of the important features being outlined with remarkable clearness."[174] In the eighteenth and the earlier part of the nineteenth century there was a great tendency to regard these lightning-figures as due to the direct transfer of particles from the neighbouring objects represented (trees, etc.) to the skin of the person struck, by some mysterious action of the lightning, which was even supposed to take the place of a photographic lens in some way. They are now thought with more reason to be analogous to the electric dust-figures, described by Lichtenberg, that indicate the distribution of electricity at a very high voltage on bad conductors. But it must be added that microscopic examinations of sections of skin showing these lightning-figures have not yet succeeded in demonstrating either their exact situation in the epidermis or cutis vera, or their mode of production. They may be the result of vasomotor paralysis. They do not seem to be generally due to haemorrhage (Haberda, Heusner, Schmitz), or to have any relation to the pressure of the clothes. They do not follow the course of the underlying bones, vessels, or nerves, as has been variously alleged on the strength of different isolated instances (Becher, Sonrier, Fischer). Mangin has suggested that they may be ideoplastic impressions, akin to hysterical stigmata in their method of production.

Considerably less common are lacerations of the soft tissues or the blood vessels, but when they do occur they are often very bizarre and striking. Lacerations of the scalp exposing the pericranium or bone are not rare, and in an unusual case recorded by Knaggs there was a lacerated wound of the right ear, which was almost torn off upwards. The formation of a haematoma in the neck, that might easily have been mistaken for an extensive bruise produced by mechanical violence, has been recorded (Macintosh, Niederheitmann); haemorrhages on either side of the dura mater are not rare, and bleeding from the external auditory meatus, with or without fracture of the bones of the skull, is fairly common. Lane described laceration of the membrana tympani. Very curious lacerations of the abdominal walls and thighs have been described by Dutt and others. In Dutt's case there was a lacerated wound five inches long two inches below the umbilicus; a penetrating wound of the abdominal wall two and a half inches long above and parallel to the left Poupart's ligament, had four feet of dark red, singed, and contracted small intestine protruding from it; and there was a four-inch lacerated wound in the left thigh below and parallel to Poupart's ligament. One might hazard the supposition that the victim in this case was struck while sitting or squatting on his hunkers. Wheeler described an instance in which lightning appeared to blow a cavity measuring three inches by one inch, and three-quarters of an inch deep, in the thigh; Vincent records an example in which six pounds' weight of flesh were lost from the thigh of a person struck by lightning.

To find a laceration in the heel or the sole, with or without comminution of the os calcis, is not very rare in persons struck when standing up or sitting out of doors, and may be taken as evidence that the electric discharge has changed its direction or met with increased resistance to its passage at this point. Penfold describes an instance in which the dense integuments of each heel "were cut as if with a sharp knife, and were torn open sufficiently to admit one's index finger easily, while the calcanea were comminuted into many pieces." The cut on the left heel was stellate, that on the right heel straight and in an antero-posterior direction. Similar cases have been recorded by Wilks, Daxenberger, Phayre, Davies, and others.

Lacerations of structures inside the body are not common, and when they do occur are not easily explained. Schneider has described rupture of the diaphragm, possibly by some sudden and violent change in the intrathoracic air pressure, in a soldier struck and killed while standing under a chestnut tree. Banham has met with a similar lesion in a horse, and quotes an example in which laceration and rupture of the heart was observed in three out of four horses struck and killed. I have been able to find only one instance of rupture of the heart by lightning in man—that recorded by Liman, who observed a hole two centimetres in diameter at the apex of the heart, with irregular walls and opening into both ventricles, which contained clots. Liman does not make any statement about the presence of blood in the pericardium in this case. A very curious instance has been reported in detail by Ouvrard, in which, although there was no external lesion of the thorax, the lower lobe of the right lung exhibited four wounds like those caused by small shot, and there was a haemothorax; the diaphragm below this was perforated, there was a slight tear in the liver, ecchymoses were seen on the gastro-hepatic omentum, there was a small round hole with bruised edges in the splenic region of the stomach, the left suprarenal and kidney showed ecchymoses, and the spleen itself was stripped of its capsule, which could not be found. The victim in this extraordinary case was seen to be struck, and cried out as she fell and died; the *post-mortem* examination was made within twenty-four hours. A small pulmonary apoplexy was found in Phayre's case. Another very unusual case was described by Claes. A sailor was struck on his ship, and showed characteristic ribbon-like burns and excoriations, due to the passage of the lightning down his trunk and limbs. He died in about twenty-four hours, after alternate periods of stupor and agitation, and towards the end with distended tender abdomen and stercoraceous vomiting. *Post mortem*, Claes found three pints of blood-stained serum in the abdominal cavity, with faecal matter, and exudative peritonitis on the intestines; there were six large black (and presumably necrotic) patches on the jejunum and ileum, in situations corresponding to the marks left by the lightning on the abdomen. It would appear, therefore, that the lightning in this case burnt the small intestine and allowed microbes to pass through its wall and set up a fatal peritonitis. Cases in which a fetus was killed *in utero* by lightning, while the mother was only rendered senseless for a few minutes and recovered, have been recorded by Franque and by Carpi; Harting describes the converse. In at least two instances women carrying children in their arms have been killed, the children being uninjured.

Injury to the tissues of the brain has often been assumed to be the cause of death by lightning, but the number of recorded instances in which it has actually

been seen is small. Phayre described a case in which there was reason to believe that the lightning had entered the left side of the head; he found the left hemisphere to be wholly disorganized, an almost homogeneous liquid of deeply greyish colour, only a small part of the corpus striatum looking normal. Somewhat similar changes were noted by Johnston and by Dürck; Bauer found the brain very soft and anaemic in his case, and the cord had apparently deliquesced to a grey fluid substance. A doubtful case has also been recorded by Barnes; Dunscombe-Honeyball found the brain in parts almost diffluent in one of his fatal instances of lightning-stroke.

Fracture of bones by lightning appears to be common in animals, and is not rare in man. Extensive fractures of the skull were noted in Knaggs's case, extending from the left parietal eminence across the right parietal bone, in which fine fissures radiated from the main crack and down to the base across the middle fossa, the orbital plate of the frontal bone (as in Heffernan's case), and the cribriform plate of the ethmoid. Dunscombe-Honeyball describes two cases in which extensive fractures of the skull were found. An excellent diagram of the elaborate fissures of the skull in a case he describes is given by Schottin; in this instance two ribs were also fractured, but without injury to the underlying tissues. Gem has recorded fracture of the humerus and the spinal column. Fractures of the tibia, or of both the tibia and fibula, by lightning-stroke have been recorded by Roy, Wilks, and Penfold; in the last case the victim was sitting down at the moment when he was struck, and there was no contusion at the seats of fracture, so that one seems able to exclude the possibility that the fracture was due to falling or to the application of external violence in any way. To illustrate the extensive fractures of bones sometimes exhibited by animals I may quote Free, who describes the case of a man who was struck by lightning and rendered unconscious, and then developed acute Bright's disease. A horse that was with the man was struck at the same time as the man and was killed. Free says that "the dead horse was as soft as a jelly, partly owing to the fact that every large bone in its body was comminuted." The exact mechanism by means of which lightning fractures bones is obscure. In cases where the heel is lacerated and the os calcis comminuted, one may perhaps imagine that an extra development of heat and steam has taken place here, with the result that the electric discharge has, so to speak, blown its way out of the body. The example described by Clark and Brigham proves that enough heat may be developed in so deeply situated a bone as the orbital plate of the frontal bone to char it, so that it is not unreasonable to suppose that small steam explosions may result if the lightning develops a less degree of heat in a moist tissue. But it is not quite easy to imagine how the tibia and fibula could be broken, without showing any external injury, as in Penfold's case, if the fractures were caused by small steam explosions taking place inside these bones. Yet there is no alternative explanation to offer. For I do not think it is imaginable that any known forces of electric attraction or repulsion [87] could exert enough violence to break bones. At any rate, the physicists appear to know nothing of electric forces of the magnitude that would be required here.

In a few well recorded instances which are extraordinary almost to the point of being incredible, strokes of lightning have effected amputations. Sycyanko quotes a case occurring in Russia, in which a boy of 12, who had had a flexed and ankylosed right knee for some years, was struck when riding on horseback. He was thrown to the ground and rendered insensible. At the same time the lightning amputated his right leg just below the knee-joint, leaving the patella and the cartilaginous upper end of the tibia intact. The boy made a good recovery; the amputated limb was afterwards found near the spot where he was struck. Vincent refers to a case in which an arm was amputated by lightning, but he did not see it himself. Dunscombe-Honeyball records the fact that he has known lightning to amputate a man's fingers. There seems no reason to doubt that such amputations might be the results of local developments of heat by the passage of the lightning through the tissues, with the sudden production of steam or other hot gases in sufficient quantity to blow the limb off. The alternative explanations that these amputations are due to "electro-caustic action," or to violent electric repulsion, appear to me unsatisfactory.

Rapid putrefaction of the bodies of persons killed by lightning has occasionally been recorded, but is not of common occurrence. Rigor mortis, on the other hand, partial or of the whole body, may appear in a few minutes, and seminal emissions are not rare.

Evidence Derived from Deaths Produced by Sudden Electric Shocks.

It seems likely *a priori* that electrocution by the sudden and violent discharges of Leyden jars, condensers, and induction coils—that is to say, by discharges of high voltage and very brief duration—is more likely than electrocution by industrial electric currents to resemble death by lightning-stroke. The experiments on death by these sudden discharges have already been laid before you; it is not necessary to do more than summarize them here, and to say that such deaths may be due either to primary arrest of the respiration, or to primary arrest of the heart's action by ventricular fibrillation. These discharges seem to produce a profound degree of nervous shock.

(To be continued.)

THE NECESSITY OF RECOGNIZING MIDWIFERY AS A BRANCH OF SURGERY.*

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THE object of this paper is to urge the importance of definitely and finally recognizing midwifery as a branch of surgery.

Obstetrics and its offspring gynaecology have in the past been considered as appanages to medicine, and regarded as provinces of the physician.

The operative triumphs of the latter, however, have of late years become so insistent that its inclusion amongst the branches of recognized surgery is now nearly complete.

It is otherwise with obstetrics, whose status still remains indeterminate. I had the curiosity to look up the official titles of the staffs of the obstetric departments of the great general hospitals and of the chief lying-in hospitals of England and Scotland. In twenty-five of these the title is that of "physician"; in twelve an indifferent denomination, such as "accoucheur"; while in ten only is the style of "surgeon" used. I further noted that in the official list of the Council of the Obstetrical Section of the Royal Society of Medicine the medical qualifications, and not the surgical, are appended to every name.

Founded on the art of the female midwife, midwifery was, in fact, the first special department of our profession. But unlike the other special departments, it arose, not as an offshoot or branch, the result of the exuberant growth of medical knowledge, but as a more or less independent subject which has in process of time become grafted on to the main stem. That that process is not yet complete is shown by the fact that medical art is still commonly divided into three primary divisions—medicine, surgery, and midwifery—some examining bodies even granting a separate diploma in the last-named subject.

The isolated position of obstetrics is early brought to the notice of the medical student. His textbooks of physiology do not deal with the phenomena of normal labour; the diseases and disasters of childbearing find no mention in the lectures on general pathology; the curriculum is divorced from either medicine or surgery, as though the morbid processes with which it concerns itself were fundamentally of a different nature to the rest of disease. He finds a separate physiology, a separate pathology, a separate clinical teaching, a separate examination.

He sees in most institutions its exponents, though styled "physicians," practising their calling almost

* Read before the Harveian Society of London.

entirely by mechanical or operative means. In the theatre attached to the lying-in wards he witnesses labour conducted with all the circumstances of modern surgery, whilst in the extern department he finds the same procedures carried out under conditions which would make any of the operations of recognized surgery unjustifiable.

What wonder, then, if, in the face of all these anomalies and contradictions, the conception of obstetrics as a separate art to which the tenets of surgery only partially apply, grows up within the student, from him is passed on to the practitioner, and finally reaches the public.

As a result of the affiliation of midwifery to medicine in the past, the analogy between reproduction and other natural processes has been too much insisted on. Child-bearing is, of course, a physiological process, but it stands alone amongst such, in that while the rest of them are exercised for the good of the individual, reproduction is exercised for the benefit of the race at the cost of the individual. The toll reproduction exacts from womankind is very definite and is levied on civilized and aboriginal alike; animals, whether domesticated or wild, do not escape it. At no other time in the life of a healthy woman is ill health so imminent as during the periods of childbearing. Pregnancy is normally associated with altered metabolic processes, closely verging on auto-intoxication; labour is an example of Nature's rough surgery, puerpery a time of healing of self-inflicted wounds.

Midwifery is an almost purely surgical art. Therapeutic treatment finds less place in it than perhaps any other department of our profession. The means it employs are almost entirely mechanical. Its operations, as compared with those of other branches of surgery, are to the full as difficult, and require, from the circumstances under which they are usually carried out, a far greater average degree of care, skill, and fortitude. Further, the liability for infection to follow them is much greater, because asepsis of the operation area is much less under the control of the operator.

Attendance on the puerperium resolves itself into the care and treatment of wounds of the genital canal—wounds naturally produced, indeed, but of the character of lacerations or abrasions, often associated with much bruising, and situated, as regards the placental site, in a position unfavourable for drainage, and as regards perineal tears in one impossible to render aseptic.

It follows, therefore, that the obstetrician stands more in need of modern surgical surroundings, accessories, and assistance than any other class of surgeon if he is to carry out his work in keeping with the present-day standards of aseptic surgery.

These statements are truisms, I venture to think, to all who give to the subject any degree of thought, yet the layman has a very imperfect understanding of them.

The unqualified reiteration of the "naturalness" of childbirth, the false conception derived from the profession itself, that midwifery is dissociated from the rest of medical science, has led the public to belittle the medical importance of labour, which, in the lower orders at least, tends to be regarded as analogous on a larger scale to defaecation or micturition. Hence has arisen, and is maintained by custom, a want of comprehension of the necessity for making proper provision and prearrangement against the time of labour, and a disinclination to expend on the event the amount of money commensurate with its importance.

It is a fact to ponder upon that amongst the working classes much more money is outlaid on a funeral than on a birth. The Jewish community, I believe, spend more on weddings than on burials; herein the members of that remarkable race show a better appreciation of the relative importance of the events, because the significance of marriage lies in the procreation which it legitimizes. But Christian and Jew alike fail to recognize that it is the ceremony of birth which should have first claim on the pocket of the community. Would that we could see some of the money now devoted to funeral and child-death insurance diverted to childbirth insurance. The Insurance Act in this respect has made a step in the right direction, but the amount paid is meagre in comparison with what the ideal conduct of labour demands.

There are in all great cities numbers of houses unfit for the habitation of human beings; thousands of tenements stinking and verminous. The patient is filthy, the bed-clothes are filthy, the supply of water limited to one small kettle, the utensils to a single bowl or basin, the room choked with lumber, dusty furniture, and frowsy garments. In such surroundings it is the custom, against which no vigorous voice is raised, to perform difficult surgical operations peculiarly fraught, under any circumstances, with the risk of post-operative sepsis.

Who is not familiar with the general surgeon who relates with pride that he successfully operated for, say, a strangulated hernia, in a dirty cottage by the light of a single candle and the assistance of only one other medical man and a nurse. But what of the obstetric surgeon who, alone and unaided, amidst similar surroundings, acts the part of anasthetist, operator, and nurse in his single person?

The absence of the conception of the "surgicalness" of midwifery, however, is not limited to the lower classes.

Consider the average lying-in room in the average middle-class house. A double bed is the first object that strikes the eye, unwieldy and inconvenient. In one corner is the baby's cradle and a pile of baby clothes; in another the washhand stand, and on it toothbrushes, bottles of hand and hair lotion, the husband's shaving materials, and various other objects. The dressing-table absorbs much of the floor of the room and most of the light from the window. It is littered with the implements of the toilet—brushes, combs, hair-pins, trays, boxes, vases, photograph frames, and other rubbish. In another corner stands the cast-clothes basket. A large wardrobe obtrudes itself on the already limited space, and a chest of drawers, piled with books, knick-knacks and various odds and ends, takes up much of the remainder. Add to these several chairs and a commode, and the picture is complete.

In this room lies a woman threatened with the possibility of surgical intervention. Were its nature any other than obstetrical, the room would not be left in that state. It would be cleared and converted, as far as possible, into an impromptu operating theatre.

From time to time articles appear in the medical press dealing with the causes of mortality and morbidity in childbirth. One such, by Dr. Haig Ferguson,[1] I have lately read. It formed the presidential address to the Edinburgh Obstetrical Society and was well worthy of the occasion. In it he gives the following striking figures:

In England and Wales puerperal fever and the accidents of pregnancy and childbirth caused the death, during the ten years 1897–1906, of 1 mother to every 228 births.

In 1907	...	... 1 mother to every 261 births.
In 1908	...	... 1 mother to every 280 births.
In 1909	...	... 1 mother in every 270 births.

Puerperal sepsis alone caused the death of:

In 1907	...	... 1 mother to every 602 births.
In 1908	...	... 1 mother to every 684 births.
In 1909	...	... 1 mother to every 609 births.*

The morbidity-rates due to this cause, could they be estimated, would obviously be very much greater.

All papers dealing with puerperal morbidity and mortality deplore the continued prevalence of puerperal fever after home-conducted labour, and variously indicate where the fault lies. Thus the doctor is blamed for not carrying out Listerian principles, or the midwife is arraigned for carelessness and uncleanliness.

But not one of them that I have read goes to the root of the matter—namely the utter want of surgical environment under which labour ordinarily takes place, a custom, I maintain due to the fact that the "surgical idea" as applied to midwifery is only partially recognized by the profession and not at all by the public. So long as these unsatisfactory conditions remain, the mortality and morbidity of childbirth will continue unduly high. The transgression against the canons of modern surgical asepsis is too great to be washed away with a bowl of antiseptic lotion however diligently used.

If we consider the results of surgical operations other than obstetrical, when carried out in hospitals and private houses respectively, it will be found that those performed in private are, on the whole, the most successful. Compare this with the results of obstetric work carried out in

* Modified from Dr. Haig Ferguson's paper.

hospitals and private houses respectively. The contrast is striking. In lying-in hospitals puerperal sepsis in its graver forms is almost abolished; in private houses it is responsible for the wastage of life and health to which Haig Ferguson and others have so forcibly directed attention.

It may be objected that the comparison is not fair, because the operations of surgery other than obstetrical are not customarily carried out in private houses unless the means of the patient permit of the surgical environment being created in the house.

But that is just the point I want to push home. In all other surgical work the medical man postulates surgical circumstances and surroundings as a necessity for the successful performance of his duties, and without them, except under great emergency, he refuses to undertake the case. Further, the public, educated as regards recognized surgery, supplies his requirements without demur, or, being unable to do so, appreciates at once the necessity of having the patient transferred to a hospital or home.

But in obstetrics a vicious circle obtains. The imperfect conception of the position of the art by the profession results in the public underrating its importance and belittling the gravity of labour. Hence has been established a custom by which childbirth takes place under conditions that outrage all the requirements of modern aseptic technique, yet in no other branch of our profession does success obtain so little praise or failure so much obloquy.

This attitude of the public in turn reacts on the medical man. He finds, when he enters practice, that it is customary to conduct labour under the faulty conditions to which I have drawn attention, and in the face of long usage he hesitates to deal with labour as with any other surgical problem. The conversion of the lying-in room into some semblance of an operating theatre, relatively aseptic surroundings, efficient assistance, and an independent anaesthetist, are looked upon as academic ideals not to be pressed for in everyday work.

The carrying out of an operation without sufficient assistance is as disadvantageous to its performance in midwifery as it is in any other branch of surgery. The thought of a surgeon curetting the uterus or ligaturing piles without an anaesthetic brings a smile to the lips, yet in obstetric work the practitioner is frequently diffident of asking for such assistance, because, by general conception, custom, and habit of thought, the public expects him to combine the offices of surgeon and anaesthetist.

The slight demands made by the obstetrician on behalf of his art results in the public habitually underpaying him. I have made inquiries amongst a number of my friends engaged in general practice for the purpose of comparing the relative amounts of the fees paid for a confinement with those received for the performance of such operations as they themselves frequently carry out.

Thus I learn that, assuming the patient's position to be such that a fee of 5 guineas is charged for the labour, then the charges for the following operations would roughly be:

For removal of tonsils and adenoids ...	3 to 5 guineas and anaesthetist's fee.
For curetting...	7 to 10 guineas and anaesthetist's fee.
For ligation of haemorrhoids	7 to 10 guineas and anaesthetist's fee

Now the outfit, skill, and care required of the obstetrician are at least as great as those demanded for the performance of these operations—they may, indeed, be much greater—while the time, trouble, and general wear and tear that attendance on a confinement involves is out of all proportion greater. Many men, indeed, have told me that midwifery does not pay, except in so far as it acts as an introduction to other forms of practice—a wrong principle, for underpaid work can never be the best work.

This low rate of remuneration is an expression on the part of the public of the small regard in which they hold obstetric art as compared with recognized surgery. In fact, obstetricians are taken at their own valuation, for they have up to now made no claim to be considered surgeons—nay, more, they have strengthened the popular belief in the trivialness of their calling by legalizing attendance on labour by a less educated class of practitioner—the midwife.

That the trained product of a maternity school is an enormous advance on the foul beldam who used to preside over childbirth goes without saying. Since the passing of the Midwives Act a marked fall has taken place in the annual number of cases of puerperal fever. Thus I find, on referring to the report of the Registrar-General for 1910, that the death-rate from this cause has decreased to 1 to every 727 births in that year.

But in so far as the Act tends to the employment of midwives *instead* of doctors, I believe it to be a step in the wrong direction. The aim should be not to cheapen the cost of labour, but to increase it; to make the public understand the importance of the event, and to teach that its proper conduct requires the environment of surgery, for the provision of which the layman must co-operate with the obstetric surgeon by prearrangement and adequate payment.

That great difficulties lie in the way of attainment to the ideal is obvious. Many of them will require years of education and social reform to overcome. Insurance against childbirth on a much extended scale, the establishment of municipal lying-in institutions where women could be attended by their own medical men under circumstances of true surgical asepsis—these are shadows cast on present thought by, let us hope, events coming somewhere in the future. But we must begin by setting our own house in order and definitely and finally recognizing midwifery as a special branch of surgery.

REFERENCE.

[1] Some Twentieth Century Problems in relation to Marriage and Childbirth, *Journal of Obstetrics and Gynaecology of the British Empire*, December, 1912.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

INJURY TO THE ELBOW INVOLVING THE ANTERIOR INTEROSSEUS NERVE.

A GIRL, aged 7 years, fell and struck the inner side of the right elbow. She was treated by a "bone-setter" until it was found that the elbow could not be flexed beyond a right angle.

She was brought to me six weeks after the accident, when extension at the elbow, pronation, and supination were complete, but flexion could be obtained only to a right angle. There was fullness about the lower end of the humerus, just above the joint, especially about the internal condyle, and some wasting of the flexor muscles covering the forearm and of the pronator quadratus. Flexion of the distal phalanx of the thumb and of the index finger was very deficient, but not entirely absent, while flexion of the distal phalanx of the middle finger was good. A skiagram did not reveal the exact nature of the injury.

From these signs it would appear that the anterior interosseous nerve was injured by the accident or involved in the callus produced after fracture at the lower end of the humerus. In the latter case the origin of the nerve from the median must have been higher than usual. The escape of the deep flexor of the middle finger, which in normal cases receives its nerve supply from the anterior interosseous, is also peculiar.

The case is perhaps sufficiently rare to warrant its being recorded.

H. M. JOSEPH, M.A., M.B.Cantab.,
B Sc.Lond., etc.

Guernsey, August 6th.

TREATMENT OF MORTON'S METATARSALGIA BY FORCIBLE MOVEMENTS.

THOSE of us who have the opportunity of seeing a fair number of cases of Morton's disease during the year know not only the misery which this condition entails, but also the unsatisfactory results of treatment, and therefore I make no excuse for publishing a method which I have adopted lately in a few cases with uniform success.

The method consists of grasping the foot with both hands, one on either side, and forcibly moving the metatarsal bones upon each other, and also forcibly flexing and

extending the foot and toes. This method is more easily shown than described, and was adopted on the presumption that possibly some small adhesion was the cause of the pain. At all events, whatever the explanation may be, the few cases which I have treated in this way were at once permanently relieved of all symptoms. One case occurred in a man of 60 years of age, who had had the condition for ten years, but he was easily cured in the manner I have described. Possibly this method may have been tried by some orthopaedic surgeons, but if it has I have not yet succeeded in finding any record of it, and therefore I have no hesitation in publishing it for what it is worth.

T. PAGAN LOWE,
Surgeon to the Mineral Water Hospital, Bath.

Reports of Societies.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

Wednesday, March 5th, 1913.

Mr. J. M. COTTERILL, President, in the Chair.

Carcinoma of Rectum.

PROFESSOR CAIRD gave an analysis of 43 cases occurring between 1900 and 1910. Rectal cancer was more frequent in males. The ages in most were between 40 and 60. The duration of symptoms from their onset to diagnosis of the cancer was on an average six months—an unfortunate and quite remediable state of affairs, as diagnosis per rectum was easy. As to symptoms, bleeding was present in every case, and was often the only symptom. Pain was only present in those cancers close to the anus, and was absent in those higher up in the rectum (about half the cases); there were often irregularities in the bowel action, constipation alternating with diarrhoea, tenesmus, passage of mucus, and in only one case the passage of pipe-stem stools. A more uncommon symptom was reflex dysuria and frequency of micturition. The tumour was palpable per rectum in every case but one, where there was a peculiar fixation and kinking of the bowel. A tumour which appeared fixed on rectal examination was not seldom found mobile on bimanual examination. An extensive operation was not advisable over the age of 60 or when there was glandular involvement or fixation of the tumour. As to choice of operations, the disadvantages of the Kraske were the frequent recurrence in the lower segment, the infrequent healing by first intention ending sometimes in stricture. A modified Lisfranc was the better operation—that is, a perineal excision, aided, if need be, by a parasacral or an abdominal incision. In a lantern demonstration the macroscopic appearances of many of the tumours *in situ* were shown, and some of the difficulties and sequelae of the operation were shown in specimens obtained from fatal cases.

The PRESIDENT agreed as to the superiority of the perineal operation. The abdomino-perineal operation was seldom required. Mr. WALLACE said that the question of technique was all-important. A functioning anus in the perineum was seldom obtainable and should not be aimed at. Where the case was not too far advanced the first step should be an inguinal colostomy, followed by thorough removal by the abdomino-perineal operation. Where patients came too late for removal of the tumour, an inguinal colostomy should alone be performed, when a considerable degree of comfort and control was often obtained. Mr. STILES said that in tumours high up in the rectum the knee-elbow position was of value, combined with straining efforts on the part of the patient, when the finger received the sensation of ballottement from the tumour. With regard to operation, he advised a preliminary colostomy. This was followed by great improvement in the digestion and general health. In the subsequent removal of the tumour, points of importance were the freeing of the pelvic colon, closure of the colon, packing and drainage of the cavity. By these means the risks of sepsis were reduced and a short convalescence secured. The abdomino-perineal operation was seldom required. An inguinal anus, in his experience, gave better control than one in the perineum. Mr. ALEXIS THOMSON agreed as to the superiority of the inguinal anus. He described the conditions present in a large series of Continental cases which he had seen where sacral anuses had been left and where the control was generally inefficient. Dr. DARLING described a case which had been the subject of a Kraske operation, living for twelve years and dying of another condition. Professor CAIRD replied.

ROYAL SOCIETY OF MEDICINE.

DISCUSSION ON ALIMENTARY TOXAEMIA.

Monday, March 10th, 1913.

Sir FRANCIS CHAMPNEYS, Bart., M.D., President, in the Chair.

A DISCUSSION on alimentary toxaemia, its sources, consequences, and treatment, was opened by Dr. HALE WHITE who gave a general survey, and Dr. W. F. ANDREWES, who dealt with the bacteriology of the alimentary canal. These papers are published elsewhere in this issue.

The Toxins of the Alimentary Canal.

Dr. VAUGHAN HARLEY said considerable difficulties occurred in the study of toxins of the alimentary canal, since pure toxin, like pure enzyme, had not yet been isolated, even from bacterial culture. Yet more difficulty confronted one in dealing with those toxins which might be formed in the alimentary tract, since an examination of the faeces would only yield the toxins which had not been absorbed. The more easily absorbed toxins would not be recovered in the stools. The occurrence of erythema and urticaria, in common with some digestive derangements after taking pure food, could only be explained by the formation of toxins in the alimentary canal. He had noted urticaria and erythema after even simple rectal lavage with normal saline solution when there was considerable constipation. Halliburton and McKendrick tried to recover the toxin in the retained stomach contents from a case of dilated stomach, in which the patient had suffered from tetany, but without success. He proceeded to mention the products occurring in the alimentary canal which might be more or less poisonous. These might be derived from the protein, fat, or carbohydrates taken in the food, or from the secretions into, or excretions from, the alimentary tract, either in health or disease, during ordinary digestion, or from putrefaction and fermentation in the canal. The secretions of the tract could undergo some putrefaction during starvation, the urine of fasting individuals containing aromatic substances. In an experiment on a man during a fast the indican in the urine decreased day by day, while phenol progressively increased, so that by the ninth day it was from three to seven times as much as in the ordinary man. The substances derived from carbohydrates and fats had little toxicity. Protein during ordinary digestion, even without the action of bacteria present in the intestine, might yield toxic products. The proteoses and simpler products, when injected directly into the circulation, could be rapidly eliminated by the kidneys, but were apparently toxic; they inhibited blood coagulation, had a lymphagogic effect, caused a fall of arterial pressure, and a febrile reaction, while large doses in animals caused death. In children and people of advanced age the epithelial cells of the alimentary canal were apparently thin, and perhaps this explained the greater frequency in them of toxic attacks. Healthy digestive processes were accompanied by an enormous amount of bacterial action; one-third of the total faeces in man consisted of bacteria, and this proportion was increased in diarrhoea. The decomposition products of protein putrefaction were practically the same whether formed by the action of bacteria or by the enzymes in ordinary digestion. If not present in too great quantity, bacteria in the intestine might be useful to the organism, and might assist in breaking down such substances as cellulose in the food. Indol, skatol, phenol, and cresol were aromatic substances formed by the breaking down of protein by various bacteria in the alimentary tract. These substances were fixed in the living cells. Indol was more easily detected in the faeces, and indican in the urine, and consequently had been more studied than had skatol, phenol, and cresol. Jaffé found that ligature of the small intestine, but not of the

large, was followed by a considerable increase of indican in the urine. The indican appeared to be derived in the bowels from the protein product tryptophan. In adults, even in health, the bacteria of the bowel produced indol as well as skatol, phenol, and cresol, while in breast-fed children these substances were not formed. Delay in the intestines led to a marked increase of aromatic substances in the bowel, which were eliminated as aromatic sulphates. But the quantity of these sulphates found in the urine did not always indicate the true condition occurring in the bowel. The quantity of fluid in the alimentary canal also influenced the putrefaction, putrid substances being formed in larger quantity where there was a decreased water absorption in the bowel. Indol was not readily absorbed by the lower part of the colon. In atony or dilatation of the caecum there was marked increase of indican in the urine. The condition of the stomach had apparently an influence on the intestinal putrefaction. Where there was delayed motility of the stomach, especially with decreased hydrochloric acid secretion, the protein putrefaction might commence in the stomach itself, hence there was an increased formation of aromatic substances in the alimentary canal. In the most advanced forms faecal vomiting occurred. Anaemia was present in all cases where the indican in the urine was increased; in some instances this anaemia seemed to be due to the increased intestinal putrefaction. In cases of pancreatic obstruction there was a marked increase of intestinal putrefaction, the increased protein remaining in the bowel being due to decreased fat absorption and the absence of trypsin, so that the protein was not properly digested in the small intestine. Experiments by Richards and Howland showed that reduced oxidation in the tissues might explain the more marked toxicity of indol in some persons. The persistence of an increased quantity of indican and aromatic sulphates in the urine was significant, and was apt to occur in middle-aged people who were in the habit of taking too much protein in their diet. In children increased protein putrefaction had a greater significance than in adults or aged people, and there was often marked retardation of growth, with mental irritability and anaemia and muscular fatigue. Adults with increased indicanuria had a muddy complexion, with lassitude and headache. In some cases there were arthritic and muscular pains. He believed a true neurasthenia could be caused by the continual absorption of indol, skatol, phenol, and cresol from the bowel. Premature senile decay with early arterio-sclerosis was apt to occur in people who had an increase of indol and urobilin in their stools. In contradistinction to putrefaction, he said it was as well to use the term "fermentation" for the breaking down of the fats and carbohydrates. Probably one never found a pure case of increased fermentation unaccompanied by putrefaction in a man after middle life. The ether extract of the stools had been shown by several observers to have a haemolytic action on the blood corpuscles. The acids when not broken down in the blood stream might contribute to acidosis by fixing some of the alkali of the blood, and this might be a serious factor in children. Gerhardt had demonstrated that in a case of obstruction of the bile duct no urobilin was present in either faeces or urine, but on the administration of bile by the mouth urobilin appeared in the stools and in the urine. The increased quantity of bile pigment present in the alimentary canal was converted by the bacteria into urobilin, some of which was absorbed and eliminated in the urine. Under ordinary conditions the bile pigment could be traced in the ileum as far aa the ileo-caecal valve.

Treatment: Medical and Surgical.

The papers on the consequences and treatment from a medical and surgical point of view respectively were read by Professor Saundby and Mr. Arbuthnot Lane. These papers are published elsewhere.

Consequences and Treatment from the Dental Point of View.

Mr. J. F. Colyer said that he entered into the debate because there seemed to be some misconception on the part of his medical friends as to the amount of dental disease prevalent. There were two main causes of oral sepsis—(1) caries; (2) gingival disease leading to periodontal disease. Caries consisted of the progressive destruction of the tooth substance, eventually leading to the opening of the pulp cavity. A septic inflammation was set up in the pulp, and in time led to a similar condition in the periodontal membrane about the apex of the tooth. The amount of oral sepsis arising directly from caries of the tooth was small compared with the sepsis from the conditions started by their presence. The effect of carious teeth was to render the teeth in the neighbourhood functionless, so that stagnation areas were formed, and from these and the collections of food marginal gingivitis ensued. Gingival disease, leading to periodontal disease, was by far the most fruitful source of oral sepsis. The gums might appear to the untrained eye almost healthy, yet the tooth socket might in places be destroyed almost to the apex of the tooth, and pus might be present in the pocket around the tooth. The progress of the disease was slow, especially in the early stages. Its extent could only be accurately gauged by examining each individual tooth with a fine probe so as to ascertain the depth of the pockets. The disease was more intractable and more serious in its results in mouth-breathers. He considered that the relationship of nasal obstruction to dental disease had not received the attention it deserved. Mouth-breathing in the child led to persistent marginal gingivitis, most marked around the lower incisors, and this eventually led to periodontal disease. Children the subjects of marked oral sepsis were below the normal weight. In adults the condition might lead to other pathological processes in two ways: (1) by direct absorption of the organisms and their toxins; (2) by the swallowing of the septic matter, leading to the setting up of gastritis. He did not claim that oral sepsis was as important as intestinal sepsis, but it was a prolific source of ill health. Where the teeth of children were bad he did not hesitate to render them edentulous; removal of ten, twelve, or fourteen teeth in a child under 5 was not at all uncommon. The supposed narrowing of the dental arch owing to this was not a serious matter, and the small extent to which this took place could be remedied by proper means; this would prevent crowding of the oncoming permanent teeth. It should always be remembered that chewing could be well carried out even where gingival disease was present; and when such children had their teeth removed they always gained in weight. He knew no means of curing periodontal disease except by free extraction.

The debate will be continued on April 14th.

Section of the History of Medicine.

A meeting of this Section was held on Wednesday, March 5th, Sir William Osler, Bart., F.R.S., President, in the chair. Dr. W. K. Sibley was elected an ordinary member of the Section, and the following gentlemen were elected Corresponding Honorary Members under the rule which allows of the election of such persons for distinguished services rendered to the history of medicine: Professor Barduzzi, Dr. Iwan Bloch, Dr. Chauffard, Professor E. F. Cordell, Dr. Fielding H. Garrison, Professor Holländer, Professor Kavvadias, Professor van Leersum, Professor Letulle, Dr. V. Maar, Lieutenant-Colonel Walter D. McCaw, Professor Karl Sudhof, and Dr. W. H. Welch.

Circumcision under the Romans.

Mr. Joseph Offord, member of the Associazione Archeological Romana and of the Egypt Exploration Fund, read an essay treating of the Roman Imperial regulations with regard to circumcision. In association with the Jews much was already familiar to Latin scholars, but new evidence was brought forward respecting circumcision of Egyptian priestly youths devoted to the cult of the ancient deities in Egyptian temples. This information had been supplied by a few manuscripts found among the many thousands of papyri of Roman times that had recently been obtained from Egypt and were now undergoing preparation for speedy publication by specialist editors. Circumcision was an old sacerdotal and, indeed, almost universal custom in ancient Egypt, and therefore, to retain the good opinion of the priests, the Roman Imperial legislators, with certain reservations, permitted the practice in the province that was so valuable a granary, and, until exhausted, a mine of taxable wealth. The importance of the papyri

consisted in their being actual documents properly engrossed in the correct phraseology for obtaining the permission to circumcise and the administrative replies granting the request. Altogether eight such manuscripts were referred to and abstracts of the contents of several of them were given, and from these a good idea of the formalities required, and therefore of the legislation governing the matter, was obtained.

A New Egyptian Medical Papyrus.

Mr. Joseph Offord also read notes on a newly discovered Egyptian medical papyrus, a much older treasure than the documents on circumcision, dating as it did from some 2000 years B.C. Its contents, concerning the list of remedies prescribed and diseases enumerated, was very similar to that of the famous Ebers papyrus published some thirty years ago, and the comparison of the two manuscripts proved that both were to a large extent made up of copies of one or more earlier collections of medical and magical texts or formulae. The contents of this new papyrus and of the Ebers and four or five more medical papyri known indicated that they were not derived from the celebrated "divine" medical, Hermetic, books, which, according to the classics, the Egyptians treasured up in certain temple libraries, but that all were textbooks used in daily work by the medical practitioners of that period. Some of the recipes were ascribed to the gods, and others to a foreign origin, but the new papyrus came from the ruins of a house in a small provincial town, and was probably an inexpensive copy, carelessly written, intended for a country doctor. The new papyrus did not advance our respect for the ancient Egyptian medicine; indeed, it depended more upon magic for cures than did the Ebers treatise. In none of the works did any conception of the fact of contagion appear; and many worse than useless remedies were recommended. Whilst it was regrettable that the new papyrus was so similar in contents to the Ebers sample, and so did not provide fresh material for the study of Egyptian medical learning, yet, as the manuscripts in many cases mutually explained each other, scholars would now be enabled to translate them both, and then medical historians would be able to scrutinize their value with greater precision than before.

Lady Sedley's Receipt Book.

Dr. LEONARD GUTHRIE read a paper on the Lady Sedley's Receipt Book, 1686, and other seventeenth century receipt books. Lady Sedley was the wife of Sir Charles Sedley, wit, poet, and boon companion of Charles II. Their only child was the notorious Catherine Sedley, mistress of James II, created by him Countess of Dorchester in 1686, the year when the receipt book was written. Dr. Guthrie gave instances of prescriptions for a variety of ailments, some serious, others trivial. Many of the receipts were written by such eminent physicians as Sydenham, Lower, and King. Attention was also drawn to other manuscripts and to some printed receipt books.

Drug Pots.

Mr. J. D. MARSHALL, of Messrs. Bell and Croyden, showed a fine collection of early drug pots. He stated that no fragment of pottery connected with pharmacy had yet been found dating from palaeolithic times. The Egyptian tombs contained small pots made of unglazed terra cotta, and pharmacy pots were often found in excavations at Pompeii and Herculaneum. The pharmacy jars of mediaeval times were divisible into Maiolica and Faience, Maiolica being a pottery formed of calcareous clay gently fired and then covered with an opaque enamel composed of lead, tin, and sand, the biscuit being generally a light yellow tint or colour disappearing under the opacity of the enamel. It was manufactured chiefly in Spain and Italy, whilst Faience, which was generally of a later date than Maiolica was principally Dutch and English. The earliest examples of Maiolica were Hispano-Moresque lustreware, made by the Moors when they occupied Spain. The vessels were copied from Oriental designs; they were decorated and were painted with metallic colours. The Italian Alberelli were much superior in design and finish to the Spanish examples. The shape was an elaboration of the joint of the bamboo in which drugs were packed and imported from the East. They were usually decorated in a single colour, the design being a combination of horizontal bands and discs, usually with some small ornament, such as a trefoil or slight wavy line. These, the earliest examples, were said to be in "camaieu," but as the art of the potter advanced the decorations became more beautiful and were executed in polychrome. Allusion was made to the vases dated 1500, which were in the Musée de Cluny, and to the set of pharmacy jars made for his domestic pharmacy by order of the Duke Gui d'Urbino in the latter part of the fifteenth century. They were probably the most costly in the world, and they were still preserved at Loreto. Many examples of very beautiful Faience ware were made in France, and the Strassburg ware was well known. The productions of the Belgian, German, and Swedish potteries were generally of a poorer quality. Delft began to be made about 1600, and was an attempt by the Dutch potteries to imitate as closely as possible the blue and white Chinese porcelain that was being imported into Holland and Italy. The manufacture of Delft was begun in England by Dutch potters, the first pottery being started at Lambeth about 1671 by John Ariene Van Hamme. The industry prospered, and there were soon twenty potteries at work in Lambeth alone. Bristol and Liverpool quickly became great centres for the manufacture of pharmacy jars. Richard Frank and Thomas Flower were well known makers in 1697, whilst Zachariah Barnes made pharmacy jars a speciality at Liverpool. The Delft of Dutch origin and that made at Lambeth, Bristol, and Liverpool, was similar in shape, but Mr. Marshall showed by examples that it was not very difficult to discriminate between them. The English body was harder, coarser, and less resonant, whilst the decoration was decidedly inferior to the Dutch workmanship. Attention was then drawn to dispensing pots, and Mr. Marshall brought forward examples to show that they had been made in England from a very early date, and that the English forms had developed certain peculiarities by which they could be distinguished from the Alberelli of Italy. The paper was illustrated by lantern slides, some of which reproduced the original colours with remarkable fidelity.

English Herbals.

Mr. H. M. BARLOW read notes on English herbals published between the years 1525 and 1640. The earliest work of this class printed in England was a small quarto volume published anonymously by Richard Banckes in 1525. Its various editions were extremely rare, but three were known to Pulteney in 1790, and these are the only editions referred to by Meyer in his standard history of botany in 1856. Despite its variety, this work was the most popular of all the English herbals, as is shown by the seventeen editions which Mr. Barlow has been able to trace, nine or ten of which are not recorded by Ames. Some appeared with different titles, and have been regarded by bibliographers as original works by Walter Lang, William Copland, Anthony Ascham, and Macer. Besides assigning approximate dates to some of the undated editions, Mr. Barlow showed that not one of these writers had anything to do with the authorship of the work. *The Grete Herball*, printed by Treveris in 1526, was a translation from the French work *Le Grant Herbier*, the origin of which was thought by many writers to be derived from the German *Herbarius* or *Hortus Sanitatis*, but Professor Camus proved it to be in part a translation of the popular Latin work on simple medicines erroneously attributed to Matthew Platerius, a Salernitan physician of the twelfth century. *The Grete Herball* was superseded by the learned and more original work of William Turner, the complete edition of which was printed in Cologne in 1568. Next appeared the Latin work of Pena and Lobel, printed at London in 1570–71, followed by Lyte's popular translation of Dodoens's herbal in 1578. The celebrated herbal of Gerard was published in 1597, but its history was not creditable to the writer. It was really a translation of the *Pemptades* of Dodoens made by Dr. Robert Preest, a Fellow of the College of Physicians. On the death of the translator, the work fell into the hands of Gerard, who altered the arrangement and published it as a work of his own. The last of the old British herbalists was John Parkinson, whose great work, *Theatrum Botanicum*, contained descriptions of 3,800 plants

—nearly double the number in Gerard. The works of Morison, Ray, Grew, and others did not come within the scope of the title "Old English Herbals." By the time they were published the science of botany had grown up to an independent position, and was no longer a branch of medicine. The writers, moreover, were botanists in the modern sense rather than herbalists. Nor do the works of Culpepper and Cole, the ardent supporters of astrological botany and the doctrine of signatures, come under this heading. Besides their scientific value, Mr. Barlow showed that these old herbals had an artistic interest, the woodcut figures of plants being of great importance in the history of wood engraving. The paper was illustrated by a number of old herbals kindly lent by Mr. Bernard Quaritch.

SECTION FOR THE STUDY OF DISEASE IN CHILDREN.

Friday, February 28th, 1913.

Mr. A. H. TUBBY, President, in the Chair.

Exhibition of Clinical Cases.

AMONG the cases shown were the following:—Dr. F. PARKES WEBER: Slight *Congenital deformity of the hands* in a child. It consisted of partial flexion of the fingers at the metacarpo-phalangeal joints. The PRESIDENT, in the discussion which followed, thought the deformity was due to congenital tightness of the palmar fascia. Also a case of *Infantilism due to mitral stenosis.* The patient, a girl aged 15, had the development of a girl aged 10. Dr. F. G. CROOKSHANK: A case of a *Mongoloid boy* in whom ethnic characters of racial Mongolism occurred. The child was not a typical example of Mongolism, but had a yellow skin, dark hair, and Chinese profile. The canine teeth were long and tusk-like. The pelvis was "high." There was considerable hypotonia of muscles. Mr. J. E. ADAMS: Two children of the same family with *Congenital fusion of the radius with the ulna* a short distance below its head. The condition was very rare. A specimen of the deformity was shown and a similar case quoted. Mr. DOUGLAS DREW: *Lymphangioma of the axilla* in a baby aged 9 months. The tumour had occupied the whole axilla, and needed removal of the pectoralis minor and an extensive dissection to excise it. Also a case of *Separated epiphysis of the femur treated by plating.* The child was shown because the plate had not been removed. It caused no inconvenience, and did not hinder growth or movement. Mr. EDRED M. CORNER: *Costo-transversectomy* for spinal caries and mediastinal abscess. The operation had allowed the abscess to be opened and drained at the level of the eighth dorsal vertebra. Also a case of *Congenital absence of fibula, deformity of tarsus, and absence of the fifth toe.* One centre of ossification represented both the astragalus and calcaneum, and the fifth metatarsal bone was also absent. Dr. EDMUND CAUTLEY: *Chronic albuminuria, with hepatic enlargement,* in a girl aged 8 years and 2 months. The urine contained white blood cells, granular, hyaline, and epithelial casts. Von Pirquet's reaction was negative, and there was no evidence of syphilis. The Wassermann reaction had not been done.

Summer Diarrhœa and Summer Heat.

Dr. H. C. CAMERON read a paper on this subject. He emphasized the importance of environment and temperature as direct causes of summer diarrhœa, in contradistinction to their more remote effects in producing infection.

MEDICAL SOCIETY OF LONDON.

Monday, March 10th, 1913.

Sir W. WATSON CHEYNE, President, in the Chair.

Rapid Section of Tissues for Microscopical Diagnosis.

DR. E. H. SHAW gave a demonstration of his method of rapid section of tissues for this purpose. He said that the method had proved to be of value in the diagnosis of obscure tumours over and over again. There were two factors to be taken into account: First, the manual dexterity required to cut a frozen section; and, secondly, the knowledge and experience of the pathologist in interpreting the section so obtained. He showed lantern slides made from actual fresh sections. The stain used in all cases was methylene blue, and the sections were mounted in the watery solution of the stain without previous fixation or clearing. There was a group of cases in which an accurate knowledge of their malignant or innocent nature was not possible without a microscopic view of the section. It was in these that a rapidly prepared section was of the greatest value. The organ which presented more problems for clinical diagnosis than any other was the breast. His experience of this work extended over nearly fourteen years, and he was convinced more than ever that it was a most useful method and one that should be used more frequently.

Celluloid Splints.

Mr. H. J. GAUVAIN read a paper, illustrated by numerous lantern slides and models, on the use of celluloid in the mechanical treatment of tuberculous disease of the spine.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF SURGERY.

Friday, February 21st, 1913.

Mr. R. D. PURREOY, President, in the Chair.

Nephrectomy.

MR. C. ARTHUR BALL pointed out that nephrectomy had not been discussed much of late. The mortality was high; improved methods of diagnosis had greatly reduced this mortality, but there still remained a risk attached to nephrectomy which was probably greater than that of any other major operation—namely, the danger of haemorrhage. Enough attention was not attached to this danger in the teaching of the subject. The kidney could be more readily reached from the front by an iliac extraperitoneal incision extended upwards and backwards in the direction of the external oblique fibres if more room were needed. This was the incision Mr. Ball always employed; the vessels of the pedicle could be readily exposed, and any abnormal vessels easily seen and dealt with. Lumbar nephrectomy should be classed with lumbar colotomy and given up. The PRESIDENT related a case which showed that a renal affection might very closely simulate an ovarian cyst. Mr. MAUNSELL asked for precise information about the position in which the patient ought to be placed. The large incision was more desirable when the diagnosis had been formed and a nephrectomy undertaken. It seemed a little severe to make this incision where the operator was going to expose the kidney and possibly save the organ. He had seen deaths from haemorrhage, but never in his own practice, and this he attributed to the fact that where he found a kidney very adherent and matted from chronic disease he adopted subcapsular nephrectomy. When the kidney was very adherent he thought it was useless to try and get it out by any other method. He had used the incision advocated by Mr. Ball when he was searching for a stone low down in the ureter, before the present *x*-ray appliances were available. In another instance he used the incision for a large multicystic kidney in a young child, and it worked very satisfactorily. Lastly, the ordinary lumbar incision made slightly longer, and an incision cut at right angles up along the external oblique, gave plenty of room for operative manœuvres. Sir JOHN LENTAIGNE said he agreed with the last speaker. He considered that the efficiency of the other kidney was the point most important to ascertain. In tuberculosis there was real danger, as in a late stage of the disease it spread down the ureter to the bladder, and then almost at once an ascending tuberculosis started which would surely attack the other kidney. The cystoscope alone would not tell at once whether the other kidney was working, nor would segregation of the urine settle the point. It was once thought that by diverting the urine from each ureter into separate channels the surgeon could tell whether the other kidney was functioning or not. Ureter catheterization was the only reliable test, but unfortunately this was a procedure which could not always be easily carried out. Even the most expert men had found it impossible to use the ureteral catheter in every case. In about 30 per cent. of cases this method was unavailable. He found a

double incision very efficient. By cutting down on both kidneys and palpating, it was possible to tell whether the kidney and ureter on opposite sides were sound, and the patient appeared to be nothing the worse. He did not consider the danger of haemorrhage quite as great as Mr. Ball asserted. In cases of perinephric inflammation he had found the subcapsular method the best. Mr. KENNEDY was also at a loss to know how far the incision was carried upwards. He considered that it began rather too low down, as the ureter itself could be explored through an incision not extended far downwards. By combining the incision at right angles with the lumbar incision the largest kidney could be taken out. In a case of very slow-growing tumour of the kidney, lasting over eleven years, where he operated over a year ago, he carried out the incision spoken of by Mr. Maunsell and found no trouble, although the kidney was greatly enlarged. He referred to the use of a clamp for removing haemorrhage. If the pedicle of the kidney was taken up and clamped before isolation of the vessels they could afterwards be tied individually and haemorrhage would be averted. It was, he said, astonishing the amount of room provided by the freeing of the last rib. Mr. PEARSON considered that the incision described was the ideal procedure. The ease with which the operator could see what he was doing was very remarkable. It was really lateral, it was not too long, and was better than the lumbar one. The application of the clamp to the pedicle in a fat subject was not easy. The instrument might not be got round all the vessels; some might easily escape, and there was considerable danger of the pedicle being cut so close to the clamp that other vessels might slip out of it. Mr. H. STOKES said that the practice of a surgeon who had performed forty nephrectomies without a single death was not to tie himself to any particular incision. It was best to plan the incision according to the type of case that was being dealt with. Mr. C. A. BALL, in speaking of the position of the patient, said he generally started by laying the patient on the back, inclining the body a little to one side. He usually started with a small incision of about four or five inches, and if there was not room enough he extended it higher up. It was astonishing what a small incision would do with a thin patient. No one now hesitated to open the abdomen for an exploratory operation, and he therefore saw no reason why this incision might not be made. He also recommended the incision for removing calculi, as he had seen kidneys very seriously damaged by the lumbar wound. He had only once seen the subcapsular operation, and had never performed it; but in cases of tumour of the kidneys it was an operation that could not be used. His object was not so much to try and convert those who had performed lumbar nephrectomy satisfactorily as to show that if students were taught that this anterior incision was a much safer method it would be an advantage. There was no reason to ask those who had found the lumbar incision satisfactory to change their technique. He considered the T-shaped incision more damaging to the muscles. Referring to Sir John Lentaigne's remarks, he said that, of course, the efficiency of the other kidney should be defined beforehand, and the kidney could easily be palpated, if desirable, by this incision. He had made use of this incision, opening the peritoneum for exploratory purposes, and the opposite kidney could be palpated in this way much easier than by the double incision of both kidneys. Mr. MAUNSELL explained that the slight opposition shown by him towards the operation described was founded on a misconception, as he did not understand from the original explanation that the incision was a short one. He thought Mr. Ball meant cutting the patient right down to Poupart's ligament.

The Location of Pus in the Hand.

Mr. A. A. MCCONNELL read a paper on the above subject illustrated by specimens and lantern slides. There were definite spaces in the hand independent of the tendon sheaths in which pus might collect; the diagnosis of pus in these situations could be made, and special incisions were required for adequate treatment. He adopted the nomenclature introduced by Kanavel, of Chicago, and in the main advocated the treatment employed by the latter. Clinical cases were cited, however, which went to prove that adequate drainage of the middle palmar space could be carried out by placing an incision behind the web of one or more of the fingers, and introducing a drainage tube. This incision avoided the digital vessels and nerves, and proved as effective as Kanavel's palmar incision. He demonstrated specimens and lantern slides illustrative of his remarks, to show that the majority of anatomical and surgical textbooks gave an inadequate account of the anatomy of the hand and the treatment of its affections. The PRESIDENT said that the fact that these injuries to the hand were so frequent, and might have such disastrous results if not well treated, invested the subject with the greatest importance. Dr. KEEGAN observed that very little was said about this subject, yet surgeons could not pass a week without seeing many cases. There was no doubt that the anatomical lines which should be followed for the correct treatment of cases of the kind were clearly pointed out, and Mr. McConnell's diagrams demonstrated the many reasons why failure was met with in the early convalescence of such cases. Professor DIXON had enjoyed an opportunity of seeing the excellent preparations which Mr. McConnell had made, and they were even more convincing than his diagrams. The arrangements of the septum which he had described were very easily shown even without injections. Mr. H. STOKES said that he had come across the subject about a year and a half ago in the *Journal of Obstetrics and Surgery*, but Mr. McConnell had put the matter yet more clearly. Dr. ADRIAN STOKES asked if the pus had progressed farther than it should have done would the incision suggested be still sufficient to drain the palm of the hand, or did Mr. McConnell suggest that the other incision spoken of would give better drainage. Mr. GUNN had felt for a long time that in hospital practice septic fingers and hands were left very much to the residents and house-surgeons, and that very disastrous results were often experienced where incisions were made in wrong positions. There were few subjects of more importance than this, and he thought it deserved a great deal more attention. Mr. CRAWFORD thought it important to note that this method of making an incision of the web of the finger was new, and had only been performed by Mr. McConnell himself. He had had only one case of the kind since he had learnt the method from Mr. McConnell, and in that instance, although the whole hand was oedematous, he determined to try drainage through incision of the web of the little finger, and the result was very good, all the symptoms having subsided in three or four days. Mr. A. A. MCCONNELL, replying to the remarks, said that the only question he had to answer was with regard to the extension of the pus upwards into the forearm. He demonstrated by means of a slide the best way to allow of efficient drainage when pus was extending upwards into the forearm. Two incisions were advisable whenever there was pus in the forearm.

SHEFFIELD MEDICO-CHIRURGICAL SOCIETY.

AT a meeting held on March 6th at the Royal Infirmary, the President, Dr. STANLEY RISELEY, in the chair, the following cases were shown:—Mr. SINCLAIR WHITE: (1) Cases illustrating the operative treatment of fractures; (2) two cases to illustrate the necessity for after-treatment after operations for talipes; (3) operations for resection of the colon in three stages; (4) papilloma of lip with early epitheliomatous changes; (5) enclosed bilateral branchial cysts in the neck. Mr. ARTHUR CONNELL: (1) Double cervical rib with pressure symptoms in arms; (2) hypernephroma of kidney, excision, recurrence, disappearance under Coley's fluid; (3) congenital ossification of intertransverse ligament of lumbar vertebrae; (4) union of fracture of shaft of femur by Lane's plates in a patient, aged 72, under intraspinous stovaine. Mr. ARCHIBALD CUFF: (1) Cases to illustrate after-effects of gastro-enterostomy performed for gastric and duodenal ulcers; (2) congenital syphilitic disease of knee-joint in a child. Mr. ERNEST FINCH: (1) Cases of infective arthritis of knee and wrist; (2) recurrent carcinoma after removal of both breasts, with extensive secondary growths on chest, neck, and in liver. Mr. W. S. KERR: (1) Epithelioma of middle-ear cleft in a man aged 50; the cleft was eroded by vascular grey granulation tissue, the facial nerve being exposed for the whole of its vertical length; the patient

had persistent pain in the right side of the head; there were exuberant granulations which bled easily; there was a history of middle-ear disease since childhood. (2) Extradural abscess with mural thrombosis of sigmoid sinus; ligature of internal jugular. (3) ? Tuberculous disease of maxillary sinus in a woman aged 58; Caldwell-Luc operation for infraorbital pain and swelling of cheek and dullness on transillumination; mucous membrane found thickened in places. On section typical tubercle giant-cell systems were seen. No tubercle were detected elsewhere. (4) Recurrent sarcoma of ethmoid after a year, treated by free removal (temporary ligature on carotid) and cauterization with Paquelin's cautery. The upper jaw was removed at the primary operation. The cavity was now almost completely epithelialized. (5) Sequestrum, removed by operation from static portion of labyrinth, showing one canal nearly complete and part of another. The patient had symptoms of cerebellar abscess, but exploration was negative. Mr. G. H. Pooley: (1) A case of interstitial keratitis treated by mercury and salvarsan. (2) A case illustrating the different varieties of cataract and injuries. (3) A middle-aged man with ulcers on each cornea, the result of a gaunister accident. The patient had glycosuria, and the only beneficial treatment for the ulcers had been by zinc ionization. (4) A girl, aged 22, with proptosis of the left eye. The eye could not be moved in any direction. Wassermann's reaction was negative. After exploration of the orbit, which was negative, immense swelling of the lids took place, which had persisted for many weeks. (5) A case of pituitary tumour in a middle-aged woman; bitemporal hemianopsia. The patient was treated for a time by thyroid and pituitary extracts. The right eye became completely blind. Cases were also shown by Dr. W. S. Porter, Dr. A. G. Yates, Mr. Herbert Emmerson, and Dr. Percival Hay. Dr. Rupert Hallam showed a series of skin cases and gave *x*-ray demonstrations.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.

A meeting of this society was held on February 7th, Mr. Freeland Fergus, President, being in the chair. Mr. J. Hogarth Pringle showed two patients operated on for *Aneurysm*: (*a*) Subclavian, (*b*) popliteal. Mr. Pringle and Professor W. K. Hunter showed a patient operated on for *Acromegaly*. Dr. J. Goodwin Tomkinson showed cases of *Coccogenic sycosis* under treatment.

The next meeting of the society was held on February 21st in the new clinical laboratory of the Western Infirmary, where a pathological demonstration was given on work carried out in connexion with the laboratory. Dr. J. Kerr Love, discussing *Syphilis and congenital deafness*, distinguished (1) post-natal deafness due to congenital syphilis, coming on during the school period, accompanied by keratitis, and characterized almost always by a positive Wassermann reaction; (2) congenital deafness due to congenital syphilis, indicating an extinct or nearly extinct blood infection, and often characterized by a negative reaction; (3) hereditary deafness complicated by congenital syphilis, a type of deafness probably Mendelian in incidence, and one whose family history was not long disturbed by the introduction of syphilis. These three types were illustrated by numerous family trees. Dr. C. H. Browning discussed the significance of the Wassermann reaction and some clinical applications. Dr. W. Hyslop Manson dealt with the reaction in ophthalmology. Dr. H. Ferguson Watson stated some results he had obtained from reactions done in 1,700 cases of children's diseases. Children suffering from true congenital heart disease all gave a positive Wassermann reaction, a proof of the syphilitic origin of the valvular lesions, while those exhibiting heart disease of the infantile type and of rheumatic origin all yielded negative reactions. Positive reactions were also obtained in all of 15 cases examined of meningitis with hydrocephalus, and in all of 85 cases, some apparently healthy, the children of tinkers, gipsies, and tramps. Dr. T. J. Mackie demonstrated and discussed the occurrence of Gram-negative bacilli in pyogenic infections of the urinary tract. Dr. W. Kiep gave an account of the treatment of 4 cases of typhus fever by intravenous injections of salvarsan. In two of these (one severe and one mild) the course of the disease appeared to be aborted by a single injection, but in the other cases (one severe and one moderately mild) the pyrexia resumed its ordinary course within eighteen hours of the injection, and subsequent injections, given after an interval of one or two days, produced similar results. Dr. G. A. Allan showed microscopic preparations from the liver, spleen, and cerebrospinal fluid of a child who had died, aged 12 weeks, of tuberculous meningitis. The tubercle bacilli found presented on culture the characters of the human type, but by inoculation into a rabbit reacted like the bovine type. Dr. J. Cruickshank discussed, with demonstration, the detection of tubercle bacilli in sputum, urine, etc., by microscopic examination and culture, and their differentiation from other acid-fast organisms. Dr. W. J. Logie discussed the urea: ammonia nitrogen ratio of the urine, and its significance in cases with glycosuria.

UNITED SERVICES MEDICAL SOCIETY.

Portsmouth Branch.

A meeting of this society was held at the Alexandra Hospital, Cosham, on Tuesday, March 4th, Colonel S. Westcott, C.M.G., R.A.M.C., President, in the chair. Fleet Surgeon F. H. A. Clayton, R.N., read a paper entitled *Three unusual medical cases*, and exhibited specimens. In an interesting paper on the treatment of *Diffuse septic peritonitis due to appendicitis*, Major G. J. Stoney Archer, R.A.M.C., emphasized the following points: Operate as soon as possible; do not irrigate or swab out the peritoneal cavity; remove the appendix; use glass drainage tubes; use iodized formalin catgut for sewing up the wound; keep the patient's thorax raised during the operation and nurse him in Fowler's semi-sitting position. Commence proctoclysis at once and continue this till the patient is able to drink freely without vomiting. The paper was illustrated by four recent and consecutive cases, which were seen afterwards in the wards. In the discussion which followed, the President, Fleet Surgeon Moon, R.N., and Major Adye-Curran, R.A.M.C., took part. Captain J. B. Grogan, R.A.M.C., read a paper on three cases of *Malarial fever contracted in England*. In all of these benign tertian parasites were demonstrated in the blood. The President, Fleet Surgeon F. H. A. Clayton, R.N., and Fleet Surgeon G. A. Waters, R.N., took part in the discussion, and several interesting hypotheses as to the possible methods of infection were advanced.

Sir Gilbert Wills, M.P., and his family have contributed the sum of £5,000 to the Royal Victoria and West Hants Hospital, Bournemouth, towards the building of an administrative block at the Boscombe branch, in memory of the late Sir Frederick Wills, who was at one time President of the Royal Boscombe and West Hants Hospital before its amalgamation with the Royal Victoria Hospital, Bournemouth.

Dr. W. M. Graham, Director of the Medical Research Institute, Lagos, in a report on blackwater fever in Southern Nigeria, 1899–1911 (London: Waterlow and Sons. 1912) expresses the belief that if it be a specific disease it must be originally and most frequently acquired from the native. Analogy with malaria, he states, would suggest that a native population which at the age of puberty had acquired practical immunity to malaria would also have acquired concurrently a similar immunity to blackwater fever, which in a protected population of adults would present itself under a modified and less acute form, and might even run its whole course without the occurrence of haemoglobinuria. If this were so the diagnosis in the native might easily be missed. In support of this contention, he draws attention to a series of sudden deaths in the Lagos Hospital, but he does not produce evidence that these were in fact cases of blackwater fever. Infection from the native, he thinks, might either be indirect or direct, and he suggests that whichever hypothesis be accepted, either the malarial or specific origin, the presence of native women, and their corollary, native children, in a European household is undesirable. He seems to suggest that sexual intercourse with native women may produce the disease; but here again he brings forward no evidence in support of his theory.

Reviews.

SPIRITISM AND INSANITY.

OF the long series of volumes of the *Bibliothèque de Psychologie Expérimentale et de Métapsychie*, edited by Dr. RAYMOND MEUNIER, many of which have been reviewed from time to time in our columns, that entitled *Spiritism and Insanity*,[1] for some not very obvious reason, was apparently the first to be translated into English.

Perhaps it should be said here that the term "metapsychism" was suggested by M. Charles Richet to the Congress of Psychology, held at Rome in 1906, "to define the *ensemble* of those phenomena concerning which the psychological sciences have not yet furnished conclusive results." The volumes of this series are of very unequal value, and, owing, perhaps, to invincible ignorance on our part, those of a "metapsychic" order appear the least satisfactory. Dr. VIOLLET'S volume belongs to this class. It is not easy to discover his position with regard to the claims of spiritualism. Apparently his attitude is one of hopeful expectancy. In any case, he is not a dogmatic sceptic, for, after showing the analogies between hallucination and the visions of spiritists and between delusions and the beliefs of these people, he says:

> But, I affirm it here, the incredulous man of whom I speak, and who wishes to believe that the spiritistic doctrine is delirium, is not myself. Philosophically, I would not dare to do so, persuaded as I am of the frailty of human knowledge, all things being probably equal in "vanity" in the eyes of Infinite Wisdom. Equally as a physician for the insane, I would not say so, because the origin of delirium, in all things arbitrary, differentiates it from that doctrine which takes its point of departure, at least, from the human "finite," and which proceeds, not at all arbitrarily, but with the judiciously eclectic concourse of anterior knowledge and of anterior religious and philosophical doctrines.

It is evident that such a chain of reasoning, which, on account of the belief that all things are probably equal in vanity in the eyes of Infinite Wisdom, would accept as of equal value deductions from ascertained fact and the superstitious beliefs of, say, the aborigines of Australia, must lead to a practical negation of the results of every branch of positive science. Looking at these matters, however, from the detached point of view of superhumanity, Dr. Viollet discusses in interesting enough fashion the various types of spiritist devotees, and in particular the mentally disordered who may be attracted by séances, and the types of spiritistic insanities. Notwithstanding much cloudy rhetoric, there is not a little of interest in the book, and the author concludes by giving excellent advice to the neuropath: "Do not complicate your life with all these mysteries and with all these miracles; avoid curiosity and live simply and quietly," and to the savants—the Crookeses, Wallaces, and Oliver Lodges—"establish a sanitary customs house at the entrance to your séance rooms." Probably, however, if this latter injunction were carried out and the mentally disordered were excluded, the "séance rooms" would be empty—deserted even by the savants with no material to investigate.

The publishers would have been well advised to have had the proofs revised by a medical man. Delirium is hardly the exact rendering of *délire*, and the need for staphylorrhaphy in a syphilitic subject "by the perforation of the palate consequent on the growth of a gum" would then not have puzzled the reader.

TROPICAL MEDICINE.

Sprue: its Diagnosis and Treatment,[2] is a book worthy of careful study. Its author, Dr. BEGG, is the advocate of a form of treatment for sprue by yellow santonin which in his hands would seem to have worked in an almost magical manner. The volume deals with the geographical distribution, morbid anatomy, pathology, diagnosis, and treatment of the disease, and a series of cases showing the results of treatment is appended. Greatest stress perhaps is laid on the treatment, and especially on the treatment by yellow santonin. Students of tropical medicine will remember an interesting and instructive paper on this drug, read by Dr. Preston Maxwell at a meeting of the Society of Tropical Medicine and Hygiene on March 17th, 1911, a paper which gave rise to a very animated discussion, in which Dr. Begg himself joined. Several of the cases treated by Dr. Maxwell had undoubtedly done well, but though this was so the consensus of opinion amongst the experts present was against Dr. Begg's line of treatment. When such a state of affairs as this exists—when, that is, one man is using a drug with success whilst another has no success—the simplest explanation would seem to be that one term is being applied to diseases of different pathogeny; there is no doubt that many chronic diarrhoeas or post-dysenteric conditions are often classed as sprue though they are not really examples of this disease. Be this as it may, the fact remains that many cases of sprue treated both at home and abroad with yellow santonin have not benefited in the least, and those who have had this experience are entitled to be sceptical. On the other hand, cases of diarrhoea and other bowel troubles of unknown etiology have often been benefited and sometimes cured by this same line of treatment; and it is therefore not one to be lightly cast aside. In view of Dr. Begg's successes, it would seem that it should be given a trial in all cases of sprue, or at least in those that are not doing well under the ordinary methods of treatment. We have one quarrel with Dr. Begg. On page 109 he states that he has not always noted the ages of his cases, but that this is the least important of the particulars. With all due deference to Dr. Begg, however, we venture to suggest that this is a most important point, since the prognosis becomes correspondingly grave with the advance of years. In other words, the older the patient the less chance of cure, and this is due, no doubt, to the general principle that the recuperative powers diminish with age. There are other points in the book, such as the treatment of chronic cases, which are open to criticism; but space will not admit of this here. The book is clearly written and the matter simply put. There is no gainsaying the fact that Dr. Begg pleads his cause with ability, and by so doing may well win converts to his belief.

The third and final part of Dr. C. W. DANIELS'S book on *Tropical Medicine and Hygiene*[3] deals with diseases due to bacteria and other vegetable parasites, to dietetic errors, and with diseases of unknown causation. Part I, it may be remembered, dealt with the diseases due to the protozoa, Part II with the diseases due to the metazoa. That three volumes should have been required demonstrates how tropical medicine as a distinct subject has grown in the last twelve years. The author believes that the attempt to group tropical diseases according to their causations and not according to symptomatology is practicable and simplifies the conception both of the diseases and of the prophylactic measures required. Some very important tropical and subtropical diseases come into this volume, notably plague, undulant fever, cholera, enteric fever, dysentery, leprosy, beri-beri, and pellagra. All those subjects are well dealt with and the reader is thus enabled to form a clear conception of the disease and everything connected with it. The material included is generally orthodox and the information accurate. A few errors do creep in, however, such as the statement that the occurrence of undulant fever in West Africa is doubtful, for positive cases have been definitely reported from there. These are small points, however, in a book covering so much ground. The book forms a fitting sequel to the other two volumes, and should take its place amongst the standard works on tropical medicine.

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[1] *Spiritism and Insanity.* By Dr. Marcel Viollet. Translated from the French. London: Swan, Sonnenschein, and Co., Ltd. 1910. (Cr. 8vo, 1p 147. 2s. 6d.)

[2] *Sprue: its Diagnosis and Treatment.* By Charles Begg, M.B., C.M.Edin., formerly Medical Officer Chinese Imperial Maritime Customs and H.B.M. Medical Officer, Hankow, China. Bristol: John Wright and Sons, Ltd. London: Simpkin Marshall and Co., Ltd. 1912. (Demy 8vo, pp. 130; plates 8. 6s. net.)

[3] *Tropical Medicine and Hygiene.* By C. W. Daniels, M.B., M.R.C.P. In three parts, with coloured and other illustrations. Part III: Diseases due to Bacteria and other Vegetable Parasites, to Dietetic Errors, and of Unknown Causation. London: John Bale, Sons, and Danielsson, Limited. 1912. (Demy 8vo, pp. 258. 7s. 6d. net.)

A useful little manual on *The Care and Treatment of European Children in the Tropics*,[4] by Dr. MONTAGU HARSTON of Hong Kong, should prove of value to tropical practitioners. Though many books have now been written on tropical medicine, there was room for one dealing with these diseases as seen in children, for a practitioner accustomed to ordinary tropical practice among adults might fail to diagnose malaria or helminthiasis in an infant or child, and would not know the doses suitable, or the precautions which it would be necessary to take, or how to allay the anxieties of the mother and other relatives. Dr. Harston's book will teach him all these things and many others. It is easy to see that it is written by one with considerable experience of his subject, and first-hand knowledge of this kind is always the most valuable. An introductory chapter is followed by four on "The climatic factors influencing European children in the tropics"; "The incidence of disease in European children in the tropics"; "Certain considerations of hygiene and the general welfare of European children in the tropics," and "The care of European infants in the tropics." Then the several diseases are discussed, and a chapter on repatriation closes the book. Interspersed through the text are 47 figures, and there is one coloured plate. A copy of this interesting work should be in the hands of all practising in tropical and subtropical countries.

The fact that a second edition of Professor GABBI's manual of tropical diseases of Southern Italy and Sicily[5] has been called for within less than two years of the first shows that it has fulfilled a real want. Knowledge of tropical diseases progresses at such a rate and the number of people interested in the subject, whether as patients, workers, or observers, increases so rapidly that it is not surprising that there should be a strong demand for books dealing therewith. When we recall the mixture of acute observation, and complete ignorance as to the real cause of these diseases, which filled the textbooks of only a few years ago and contrast this with the result of modern research, it is no wonder there should be a need for standard books on the subject. Amongst such books Professor Gabbi's deserves a favourable place. The greater part of the book is devoted to Malta fever and to various forms of what the author calls Leishmaniosis (kala-azar, oriental sore, etc), and one of the features of this edition is the exposition of the later views with regard to the Leishman parasites and an attempt to group the various forms of disease which they cause. In order to help the man who cannot avail himself of the decisive (when positive) tests of the bacteriological laboratory, and also in those cases where these tests are negative, the author goes rather carefully into the differential diagnosis from the clinical point of view. Other sections of the book are given up to "three-day fever," dengue, and bubo. There are some good chromolithographs of the blood and associated parasites; the book is of a size handy and convenient either for reading or for carrying in the pocket.

Dr. F. O. STOHR has published in French a book on sleeping sickness in Katanga.[6] The material contained in it is the result of his two years' work in that region. The most important part is undoubtedly that bearing on the prophylaxis of the disease and the measures required to prevent its further spread. He goes into these in great detail, and on the whole his suggestions seem sound, though some of them would appear to be difficult of execution. It is to be hoped, however, that the Belgian Government will see its way to act upon them where possible, for, as Stohr says, it is a subject of the very greatest importance, both from the point of view of commerce and of prestige to that nation.

[4] *The Care and Treatment of European Children in the Tropics.* By G. Montagu Harston, M.D.Lond., Ophthalmic Surgeon to the Tung Wa Hospital, Hong Kong; Examiner in Materia Medica and Therapeutics, Hong Kong College of Medicine, etc. With Introduction by Sir Patrick Manson, G.C.M.G., M.D., LL.D. London: Baillière, Tindall, and Cox. 1912. (Cr. 8vo, pp. 248, plates 17. 7s. 6d. net.)

[5] *Malattie Tropicali dell' Italia Meridionale e della Sicilia.* Del Professor W. Gabbi. Messina: Giuseppe Principalo. 1912. (Cr. 8vo, pp 230. L. 3.50.)

[6] *La maladie du sommeil au Katanga.* By F. O. Stohr, M.B., B.Ch.Oxon. London: Constable and Company, Ltd. 1912. (Roy. 8vo, pp. 83; Tfn. 6, figs. 109. 4s. net.)

DEVELOPMENTAL PERITONEAL ADHESIONS.

ANATOMISTS have always been careful to educate us thoroughly—sometimes to weariness in our student days—in the various normal complicated folds and layers of the peritoneum, and they have not been slow to point out aberrations and irregularities in its arrangement. But of late years the attention of surgeons has been attracted to some dispositions of peritoneal layers with pathological consequences of great moment. Mr. Arbuthnot Lane was the first to classify the symptoms associated with intestinal stasis and to maintain that it was a clinical entity of distinctive and not uncommon type; the existence of the "ileal kink" described by him is now recognized as one cause of stasis. Then, Dr. Jackson in America described a diaphanous membrane which he had observed stretching over the ascending colon from the hepatic flexure to 3 in. above the caput and enveloping the colon. This membrane gave rise to a kink at the hepatic flexure with obstructive symptoms. Next, Professor Payr in Germany described a splenic kink brought about by a short tense phreno-colic ligament with secondary adhesions of transverse and descending colon; and at the same time it was found that there were adhesions or bands of similar nature fixing the meso-sigmoid to the left iliac fossa.

The origin of these structures found at the four angles of the colonic square has been a matter of some discussion, and it is thought they are much more common than we have hitherto believed. That, at least, is the opinion of Mr. H. M. W. GRAY and Mr. ANDERSON, of Aberdeen, who have published a most interesting pamphlet on *Developmental Adhesions Affecting the Lower End of the Ileum and the Colon.*[7] Mr. Gray is in complete agreement with other writers as to the chain of symptoms due to intestinal stasis, but he regards the stasis as the effect and not the cause of the adhesive peritoneal bands found in the lower end of the ileum and in the colon. He quite frankly says that he does "not believe that in the first instance any of these adhesions are due to crystallization of the lines of strain," which is Mr. Lane's explanation. Nor can he accept the theory that Jackson's membrane is due to pericolic inflammation. Equally summary is his dismissal of C. H. Mayo's explanation that Jackson's membrane is of congenital origin formed as a result of the burrowing of the caecum behind the posterior parietal peritoneum, as there is no evidence that such a mode of descent ever takes place. Mr. Gray believes that all these forms of adhesion are due to "excess of physiological fusion." If they do not manifest themselves till adult life the congenital origin is not discounted any more than the late appearance of an inguinal hernia is evidence against the congenital origin of the sac. He explains the formation of Lane's membrane as the product of developmental changes. Towards the end of fetal life the lower end of the ileum enters the caecum from behind or even from the outer side; the peritoneum covering the under surface of this part of the ileum and its mesentery may become fixed to the dorsal parietal peritoneum of the iliac fossa. In the subsequent development and distension of the ileum and caecum the peritoneum reflected from the iliac fossa to the bowel is partly pulled out (that is, by ileum) and partly pushed out (by caecum) in the form of a roughly quadrilateral or triangular membrane. Similarly, Jackson's membrane is to be regarded as simply the right margin of the great omentum (which ordinarily reaches as far as the hepatic flexure) thinned out and fatless. Excess of physiological fusion more easily explains the adhesive bands at the splenic and sigmoid corners.

The writers of the essay before us believe that these congenital peritoneal deformities have much to do with the production of visceroptosis, and they call attention to the relation frequently seen between visceroptosis, narrow build or physique, and the finding of developmental adhesions. As to this last factor in the relationship, their experience is that "Lane's membrane was found in 10 per cent. of all cases in which thorough examination of the right iliac region was possible." This seems a high percentage, but it may easily be checked by observations in *post-mortem* examinations in various parts

[7] *Developmental Adhesions Affecting the Lower End of the Ileum and the Colon.* By H. M. W. Gray, M.B., F.R.C.S.Edin., Surgeon and Lecturer on Clinical Surgery, Royal Infirmary, Aberdeen; and William Anderson, M.B., Ch.B. Aberdeen University Press. 1912. (1s.)

of the country, for this disease may vary in different parts of these islands. The essay may be commended to the notice of the profession, for the subject is one requiring more numerous observations and a keener outlook for cases of the kind.

FIELD SANITATION FOR TERRITORIAL OFFICERS.

LIEUTENANT-COLONEL AVERILL'S *Field Sanitation*[8] should be welcomed by all officers of the Territorial Force, but especially by the regimental medical officers, who are usually busy men and have little leisure for studying books of regulations or textbooks on military hygiene. On the other hand, if they go into camp without any definite notions of their duties, beyond that of prescribing for the minor ailments of the daily sick, they are not likely to acquire much useful information during their training or to give to the commanding officer the assistance desired in maintaining the health of the battalion. A short study of this little manual will show them how much there is to be done and how to do it.

The book begins with a short sketch of the organization by which the health of the territorial army is to be maintained in time of war. Next comes some very practical advice on the hygienic precautions to be observed on the march and in camp; the sanitation of camps is well explained, and the book concludes with a summary of the medical officer's duties in camp.

Under "Purification of Water" we may perhaps be permitted to make one or two minor criticisms. A blanket is very little use as a rough filter after the addition of alum; its texture being coarse, the precipitated particles are not caught in its meshes. To get the best value out of alum and wood ashes, the latter should be well rubbed into a wet sheet nailed on to a wooden frame, so as to form a trough; the water, with the added alum, should then be gently poured into this. On page 14 sodium sulphate is mentioned as a chemical for the purification of water; presumably the acid sulphate is intended.

This is an excellent little book, which may confidently be recommended to all medical and combatant officers of the Territorial Force.

NOTES ON BOOKS.

DR. C. CLARK BURMAN, of Alnwick, Northumberland, has issued a short pamphlet dealing with *The Responsibilities, Rights, Duties, and Privileges of Insured Persons and Medical Men under the Insurance Act, particularly in Rural Districts*.[9] The object is to place before insured persons those particular points in which medical service under the Insurance Act differs from private practice, meaning by this the position of doctors and patients under a capitation system. The writer complains that one great imperfection of the Act is its omission to provide for the extra expenses which country practitioners have to meet in carrying out their share of the work. He appeals to insured persons to exercise a sympathetic consideration for the doctor in respect to the demands made on his services, especially referring to night visits and calls out of hours; stress is laid also on the duty of patients to go to the doctor instead of expecting him to visit them whenever possible. The duties of doctors are considered under four heads—first, to give treatment such as can properly be given by a general practitioner of ordinary professional competence and skill; secondly, to visit patients at their homes only when the patient cannot go to the doctor's surgery; thirdly, to attend at places specified at fixed hours, which both doctor and patient should strictly observe; and fourthly, to attend personally when possible or when precluded from personal attendance to provide another practitioner as deputy. Some danger is seen in the fact that popular medical men may choose for their list only patients likely to need little attention, leaving cases that seem likely to be troublesome to other practitioners, who may thus get an undue share of work while only receiving the same capitation fee. The author considers that "some obligation rests on the profession to view with a charitable reserve deficiencies and imperfections which are incidental to the setting into motion of such a massive piece of legislation," and thinks that the experience gained during the first three months' provisional service will provide data on which a system on a more equitable and less irksome basis may be established.

[8] *Field Sanitation for Territorial Officers.* By Lieutenant-Colonel C. Averill, V.D., M.D., D.P.H., R.A.M.C.(T.F.), Sanitary Officer, Welsh Division, Territorial Force. Aldershot: Gale and Polden. 1913. (Demy 8vo, pp. 34. 1s. net.)

[9] Pp. 15. Published at the *Guardian* Office, Alnwick.

Dr. Desfosses, *La Presse Médicale*, 120, Boulevard Saint Germain, Paris, asks us to state that a copy of the handbook to medical institutions in Paris noticed in the BRITISH MEDICAL JOURNAL of February 22nd, p. 397, will be sent free to any British medical man who applies to him.

MEDICAL AND SURGICAL APPLIANCES.

Celluloid Splints and Appliances.

FOR a good many years celluloid has been used, chiefly abroad, for spinal supports, splints, and other apparatus, and, indeed, for nearly all purposes for which stiff leather is used. In this country, however, it has been very little employed, and for two reasons: First, because its application involves a rather troublesome technique with which surgeons themselves have not cared to grapple, while the instrument makers have not laid themselves out for this kind of work; secondly, because of the inflammable nature of the material, which constituted a very real danger to the patient. Both these objections have lately been removed, for a method of preparing celluloid splints has been patented under the name of Pexuloid, for which it is claimed that there is no danger of fire. This claim, as far as our experience goes, is certainly justified. We have held a strip of one of these splints in the full blast of a gas blowpipe, and find that it slowly chars, with the evolution of a very little flame. As soon, however, as the strip is removed from the blast it ceases to smoulder and quickly cools, thus showing that at any ordinary temperature the material is incapable of combustion. Nevertheless, it retains all the useful qualities of celluloid: strength, lightness, and impermeability. Surgeons need no longer undertake the tedious and troublesome processes involved in making these splints, for they are placed on the market and made for all sorts of deformities and defects by Mr. W. Longmate, of 56, Weymouth Street, Portland Place, W.

MEDICINAL AND DIETETIC PREPARATIONS.

Pure Olive Oil for Medicinal Use.

OLIVE oil has long been employed in medicine, but principally in various preparations for external use. More recently its internal employment, usually as a laxative, has increased considerably, large doses being given both by the mouth and by the rectum. For such purposes it is obviously desirable that a pure oil of fine quality should be employed. We have recently received from Messrs. Cosenza and Co. (28A, Clarges Street, London, W.), a sample of an olive oil which they have put on the market particularly for medicinal use. Our determinations of the constants of this oil gave the following results: Specific gravity, 0.9163; refractive index (at 20° C.), 1.4685; saponification value, 190.1; iodine value, 83.9; melting point of fatty acids, 25° C. These figures are all typical of a pure olive oil, and special tests for arachis, sesame, and cotton-seed oils showed them to be absent. The acid value was found to be 2.1, representing about 1 per cent. of free oleic acid, and the flavour of the oil was excellent.

THE Hunterian Society's Annual Medal will be awarded to A. Graham Stewart, M.B., Ch.B.Aberd., for his essay on "Raised Arterial Pressure and Arterio-sclerosis" at the annual meeting of the society on April 23rd, when Dr. Stewart will read a paper founded upon the essay.

AMONG recent leaflets issued by the Board of Agriculture is one (263) on the mustard beetles. *Phaedon betulae*, about one-eighth of an inch long, prefers the mustard plant, but will feed also on the cabbage, turnip, swede, cress, and charlock. In the spring the beetles, which have lived through the winter in crevices or the hollow stems of wild plants, come out and lay their yellow eggs on the under side of the leaves. The beetles and larvae can be shaken off into receptacles containing paraffin or tar, but a badly-infested crop should be dug in. The turnip, mustard, and cabbage flower-beetle (*Meligethes aeneus*), only one-twelfth of an inch long, may also be very destructive; it lays its eggs in the opening buds. Another *Phaedon*, which lives on cow-parsnip and hogweed, may attack celery and parsley. Other leaflets deal with the cultivation of onions (264) and utility rabbit-breeding for smallholders (265).

DAVID LIVINGSTONE.

Born March 19th, 1813.

On March 19th, 1813, David Livingstone was born in a house in Shuttle Row, in the village of Blantyre, on the banks of the Clyde, in north-west Lanarkshire, Scotland; he died on May 1st, 1873, in a hastily built hut, in Chitambo's village, in the country of Ilala, to the south of Lake Bangweolo, Central Africa; and in these sixty years he had literally, and without any exaggeration, opened up the Dark Continent to the light of medicine, of civilization, and of Christianity. He was great as an explorer and geographer, for he travelled twenty-nine thousand miles and explored a million square miles of territory; he had great visions of the future and indomitable courage, for he foresaw the linking up of the Cape with Cairo, the carrying of education and of Christianity to the teeming millions of Africa's children, and he never faltered in his belief that the slave trade would ultimately be crushed out; but he was also a medical man, and it would ill become the profession of which he was a member to allow the centenary of his birth to pass without notice. Medical men may well delight to honour the memory of the man who has been called the "Columbus of Africa," although the comparison with the discoverer of America is not altogether a happy one. Of Livingstone it has been said that it would not be out of place to designate the whole interior of the African continent a memorial to his genius for exploration and to his heroic sacrifices and achievements.[1]

This is not the place for an appreciation of Livingstone's work as a missionary or as an explorer; but some attention may quite suitably be given to the medical aspects of his early life in this country, of his later life in Africa, and to the medical developments which have taken origin in the enthusiasm which sprang up when the full significance of his life's work and of his lonely death began to be recognized.

Young David Livingstone became a doctor that he might be a missionary. One of his boyhood's heroes was Dr. Gutzlaff, the medical missionary to China, and he at first looked to China also. At the age of 10 he had gone into a cotton mill in his native Blantyre as a "piecer," his duty being to tie together the broken ends of any threads which might chance to break in the spinning; and here he made a beginning for getting a qualification in medicine by studying Latin in his spare minutes. The story is that he propped up Ruddiman's Latin *Rudiments* on the top of the spinning frame, and got by heart his declensions and the like whilst walking to and fro in front of it. This was during the day from 6 a.m. to 8 p.m., and at night he worked at his books at home. One of the books which he delighted in at this time was Culpepper's *Herbal*, in which it may well be imagined he found information as strange as any he was afterwards to obtain in the wilds of Africa. This was his first medical reading. He saved enough money by his work to enable him to take out medical and divinity classes in Glasgow, for he had become a spinner in the mill, and so able to draw better wages. There was no Carnegie Trust in Scotland in these days to give financial aid to young lads with brains enough to pass the examinations for the learned professions; but the London Missionary Society came to Livingstone's assistance, and, after some time spent at Chipping Ongar in 1838, and later in the London hospitals, he was admitted (in 1840) a Licentiate of the Faculty of Physicians and Surgeons of Glasgow. Meantime he had met Dr. Moffat, with whom he was to be more closely related erelong, and had had his thoughts turned somewhat from China, to which he had felt strongly attracted, and directed to Africa instead. Moffat said to him one day that if he would push on beyond his old station in South Africa he would come to a vast unoccupied district, where on a clear morning he (Dr. Moffat) had seen the smoke of a thousand villages, and no missionary had ever been. So at the close of 1840 Dr. Livingstone set sail for Algoa Bay, and it is characteristic of him that he learnt how to use the quadrant from the captain on the voyage.

It is noteworthy that in his gaining of a medical qualification Livingstone showed that same determination to achieve his purpose of which his life in Africa gave so many evidences. It is told of him that as a boy he not only climbed to a higher point in the ruins of Bothwell Castle than any other, but also carved his name up there. He had some stiff climbing to do in Africa, and he left his name cut out there too.

During all the many years he spent in the heart of the Dark Continent, making the discovery of the lakes Ngami, Shirwa, Nyassa, and Bangweolo, and of much else, he never forgot that he was a doctor as well as a missionary. His writings are full of his medical experiences, and one must admire the extraordinary accuracy and insight of many of his observations. Even in the twentieth century his name is constantly cropping up in books on Africa. In an article, for instance, on "Some Tribal Customs in relation to Medicine and Morals of the Nyam-nyam and Gour People,"[2] published in 1911, Livingstone is quoted eight or nine times. "I have an immense practice," he wrote once; "patients walk 130 miles for my advice; this is the country for a medical man, but he must leave fees out of the question."

It is very interesting, too, to take notice of how often medical phraseology tinges Livingstone's ordinary conversation and gives point to his utterances. Take that most memorable message of his to the *New York Herald*, in which he spoke of the slave trade these piercing words: "All I can say in my loneliness is, May Heaven's rich blessing come down on every one—American, Englishman, Turk—who will help to heal this open sore of the world." Take, again, this reflection, written in his Journal under the date June 24th, 1872: "The medical education has led me to a continual tendency to suspend the judgement. What a state of blessedness it would have been had I possessed the dead certainty of the homoeopathists, and as soon as I found Lakes Bangweolo, Moero, and Kamalondo pouring their waters down the great central valley, bellowed out, 'Hurrah! Eureka!' and got home in firm and honest belief that I had settled it [the source of the Nile] and no mistake. Instead of that I am even now not cocksure that I have not been following down what may after all be the Congo."

But medicine did more than tinge Livingstone's language and thought. Dr. A. G. Miller[3] has found evidence in the great explorer's *Missionary Travels in South Africa*, published, let it be remembered, in 1857, that he was a pioneer and discoverer in medical science as well as in other things. The time referred to was 1852, and Livingstone wrote:

> On the 30th of May I was seized with fever for the first time. . . . The temperature in the axilla, over the heart, and region of the stomach was in my case 100 deg., but 103 deg. at the nape of the neck and throughout the course of the spine. There were pains along the latter, and frontal headache. . . . Anxious to ascertain whether the natives possessed any remedy of which we were ignorant, I requested the assistance of one of Sekeletu's doctors. . . . After being stewed in their vapour baths, and smoked like a red herring over green twigs, I concluded that I could cure the fever more quickly than they can. The native treatment is, however, of service if employed in conjunction with a wet sheet, and a mild aperient in combination with quinine. . . . There is a good deal in not "giving in" to this disease.

Dr. Miller remarks:

> This experience of Dr. Livingstone's was in 1852, when clinical thermometers and the wet pack were practically unknown in the treatment of fevers. The administration of quinine along with a laxative is a method which I have found most useful in my own practice. The laxative seems to increase the activity of the quinine and prevents unpleasant symptoms, even when the quinine is administered in large doses. Dr. Livingstone's concluding remark is quite up to date. His testing the native doctor's powers on himself was very characteristic of the man.

Space, however, fails to refer to more than these medical incidents and reflections in Livingstone's books and journals; but it may be said in passing that medical men who have not read the various works he published and the letters and records he wrote have, even from the purely professional point of view, a treat in store. No sadder story may be found than that of the weary, disease-stricken explorer's death in the swamps to the south of

[1] Dennis, J. S.: *Christian Missions and Social Progress*. iii, 424, 1906.

[2] Anderson, R. G.: *Fourth Report of the Wellcome Tropical Research Laboratories at the Gordon Memorial College, Khartoum*, vol. B, pp. 239–277. 1911.

[3] *Edinburgh Med. Missionary Soc. Quarterly*, xiii, p. 124. 1913.

Bangweolo, brightened as it is to some degree by the marvellous fidelity and resource of his native servants, who, after doing a rough and ready *post-mortem* examination and after burying his heart under a tree in Chitambo's village, faced extraordinary difficulties and dangers in carrying his body to Zanzibar. An account of the necropsy performed in London by Sir William Fergusson is given in the pages of this Journal,[4] and it is touching to read that the body was identified with absolute certainty by the condition of the left arm bone, which showed the results of the bite of the lion received thirty years previously. Recently the question has been raised by Dr. Sander of Berlin as to what was the exact nature of the disease from which Dr. Livingstone died[5]; and not a little evidence is led, from a perusal of Livingstone's *Last Journals* and our present knowledge of the symptomatology of tropical maladies, that he was suffering from trypanosomiasis. If this be so, then the greatest medical problem of the Central Africa of the present time is linked pathetically with the death of the man who did so much for the welfare, bodily and moral and spiritual, of that wonderful continent.

Livingstone's death was not an end, it was rather a new beginning of Africa's enlightenment. We have not here to do with the political and religious results which may truly be said to have had their origin in the life work of the intrepid and heroic medical missionary; but their greatness is confessed by all. His work also has not been left without memorial, for Livingstone is the new Rhodesian capital near the Victoria Falls, the "sounding smoke" which so fascinated and puzzled David Livingstone, till he saw with his eyes these wonderful falls on the Zambesi, twice as large as Niagara. But a few sentences must be written here regarding the medical memorials of his work as a physician and a missionary which have sprung up both in Africa and at home.

In addition to the mission to Central Africa established during Livingstone's lifetime by the universities of Oxford and Cambridge, and in response to his appeal, the Church of Scotland gave the name of his birthplace (Blantyre) to its industrial mission in the Shiré highlands, about the year 1875. The Livingstonia Central Africa Trading Company, better known as the African Lakes Corporation, put steamers on Lake Nyassa soon after the explorer's death; the Stevenson Road, too, was another result of his pioneering work. The United Free Church of Scotland's work in Livingstonia is another memorial to Livingstone, and as it has a strong medical work going on under the veteran physician, Dr. Laws, a few words may be given to it.

Whilst Dr. Livingstone was still alive he had a great admirer and helper in another medical man, James Stewart, afterwards to be known all over the world as Dr. Stewart of Lovedale. When Livingstone died, Dr. Stewart was one of those who helped to bury him in Westminster Abbey, and from there he went direct to the General Assembly of the Free Church of Scotland in Edinburgh, and made an appeal which ended with the following words:

> I would humbly suggest, as the truest memorial of Livingstone, the establishment by this Church, or several churches together, of an institution at once industrial and educational, to teach the truths of the gospel and the arts of civilized life to the natives of the country, and which shall be placed on a carefully selected and commanding spot in Central Africa, where from its position and capabilities it might grow into a town, and afterwards into a city, and become a great centre of commerce, civilization, and Christianity, and this I would call Livingstonia.

This was in 1874 (May), and soon thereafter the necessary funds were forthcoming. Dr. Robert Laws was found and others with him, and, just twelve months after Stewart made his appeal, the Livingstonia party sailed from London, taking with them the little steamer, the *Ilala*, to be built up and set afloat on the lake. Now, after thirty-six years,[6] there are in Livingstonia over seven hundred preaching stations, a church of over eight thousand communicants with eight thousand candidates for baptism, over seven hundred schools with thirteen hundred teachers and nearly fifty thousand scholars, and over it all presides Dr. Laws. With him are some thirty-five missionaries, of whom seven are medical missionaries from Scotland. Indeed, the medical work has always been a strong element in the success of Livingstonia, and the Livingstonia doctors have done no small service to tropical medicine in many of its departments, their word carrying weight in connexion with sleeping sickness and all such matters.

There are other memorials to Livingstone in the land which he so dearly loved, but some reference must now be made to memorials at home. In a recent article in the *Cornhill Magazine*,[7] Sir Harry Johnston sympathetically and appreciatively deals with Dr. Livingstone's life and work; but he brings his article to a close with the following sentences, which may well excite surprise:

> So far as I am aware, no notable statue, or a statue of any merit or publicity, has ever been erected to commemorate this great man in a public place in England or Scotland. The British South Africa Company has put up a memorial to him at the Victoria Falls, but Great Britain and British South Africa have still to acquit themselves in some way for the immense debt that they owe to David Livingstone.

Now South Africa, with its Livingstonia, Blantyre, Lovedale, and other missions and centres of commerce and education, may be looked to for an answer to this surprising statement, but something requires, perhaps, to be said from the home side.

First, as to statues. No traveller arriving in Edinburgh by the North British Railway can leave the Waverley Station without passing within a few yards of the bronze statue of Livingstone which stands in the East Princes Street Gardens. It was inaugurated in 1876, and came from the hands of Mrs. D. O. Hill, the sister of Sir Noel Paton. There may be two questions whether it worthily commemorates the great explorer—indeed it may safely be said that Livingstone was not thinking of statues when he made his appeal to close the open sore of Africa—and the statue itself is rather overshadowed by the great and imposing mass of the adjacent Scott Monument; but there it undoubtedly stands and can be seen of all men.

There is, however, a better memorial of Livingstone in Edinburgh, one more after that man's own heart. It is the Livingstone Dispensary and Institute of the Edinburgh Medical Missionary Society in the Cowgate. Soon after Livingstone's death the directors of this society, with the full approval of Livingstone's family, resolved to rebuild the entire dispensary and mission premises in order that they might better serve for the training of young men who desired to go out as medical missionaries. A bazaar, under the patronage of H.R.H. the Princess Louise, was held, and money came in other ways, so that in 1877 the venerable Robert Moffat, Livingstone's father-in-law, was able to lay the memorial stone, and in the following year the premises were opened. The Livingstone Dispensary was in 1903 again rebuilt and extended to cope with the increasing work, and in it during all these thirty-five years medical students, men and women, training as missionaries, and attending the medical classes of the Edinburgh University and Extramural School, have learnt how to deal with the sick and poor, and have carried the knowledge so gained to the ends of the earth. At the present time no fewer than a hundred fully qualified medical men and women, who received their practical training in 39, Cowgate, are serving under various missionary societies in all parts of the world. Dr. Livingstone was not a man whose religion could be made to fit into the groove of any sect, and in this respect the dispensary which carries his name would fully have earned his approval, for in it have been trained students belonging to practically all the Protestant churches of Great Britain, and applicants have not been refused from the Protestant churches of Germany, Denmark, America, and other lands. Its old students are now at work abroad under the C.M.S., the L.M.S., the B.M.S., the S.P.G., the Church of Scotland, the United Free Church of Scotland, the English Presbyterian Church, the Danish Missionary Society, the Wesleyan Missionary Society, the Presbyterian Church of Victoria, the China Inland Mission, the Salvation Army, the Sudan Pioneer Mission, and some twenty other bodies; so that it is widely enough represented to be truly called interdenominational

[4] BRITISH MEDICAL JOURNAL, 1 for 1874, pp. 523, 527.
[5] Sander: *Arch. f. Schiffs- und Tropen-Hygiene*, viii, p. 481, 1903.
[6] *The Livingstonia Mission of the U. F. Church of Scotland, Annual Report for 1911.*
[7] *The Cornhill Magazine*, March, 1913, pp. 321–332.

and unsectarian. A further memorial has been raised in it to Livingstone within the past few months. About this time last year the directors appealed for £1,000 to be called the Livingstone Centenary Fund, the interest of which was to be used to pay the class fees of a "Livingstone Student" of the Edinburgh Medical Missionary Society. At the time of writing all the money required has been received, so that this additional memorial to David Livingstone has been assured.

Near London also (at Leyton) there exists a medical memorial to Livingstone in the Livingstone College, with Dr. Charles F. Harford as Principal and Secretary. This college, which was established twenty years ago, does a work which has also earned the approval of Livingstone's friends and relatives. It gives a carefully arranged course of elementary medical training for missionaries going to lonely places; its students do not become medical missionaries, and they sign a declaration that they will not take that name, but they gain knowledge concerning the prevention of disease, and the use of simple treatment, which is of great service to them abroad. This college also is endeavouring to raise a Livingstone Centenary Fund of £10,000 to establish itself more fully and securely.

In London itself there is a scheme on foot to raise a memorial to David Livingstone, and the form which it is to take is the freeing of Charing Cross Hospital (at which the explorer was for some time a student) from the burden of debt which keeps some of its wards closed. For this purpose a Centenary Million Shilling Fund is being formed.

In Glasgow, too, a Livingstone Centenary Memorial Fund is to be collected for the promotion of medical missionary work in Central Africa, for the foundation of a Livingstone scholarship in Anderson's College Medical School, and for the promotion of the scientific study of geography in the University of Glasgow, and the endowment of a Livingstone lectureship or professorship. An appeal, too, is being made for funds to build a Livingstone Memorial Training College on the shores of Lake Nyassa, where already there is a David Gordon Memorial Hospital.

A proposal to endow, improve, and extend the Cottage Hospital at Blantyre as a fitting means of celebrating the centenary of Dr. Livingstone has been set on foot by the County Council of Lanarkshire. As the hospital is in the parish of Livingstone's birth, it is thought that no more appropriate place could be selected for a monument, and that no more worthy purpose could be chosen. The institution will be known as the "Livingstone Memorial Hospital," and an appeal is being made for funds to carry out the proposed scheme.

Surely there are not a few memorials in being or about to be; and the life and work of David Livingstone are not likely to be forgotten for lack of medical, educational, religious, and even plastic monuments.

During the next few days memorial meetings and services are to be held in many places in this country and in South Africa, and no doubt the medical aspects of Livingstone's life will not be forgotten in any of them; but here in this Journal, as was, of course, fit and right, attention has been mainly directed to the explorer as a physician and to his missionary work in its medical aspects. At the same time, no one can read or think about him without at once recognizing that the true and only centre of his life was the Cross; all else was adjuvant and auxiliary and subordinate to that.

The concluding stanza of the lines which appeared in *Punch* on April 25th, 1874, is equal to any of that journal's best utterances:

> He needs no epitaph to guard a name
> Which men shall prize while worthy work is known;
> He lived and died for good—be that his fame.
> Let marble crumble: this is Living-stone.

This year the medical pilgrimage organized by the central German committee for medical educational tours will visit the British Isles. It will start from Hamburg in a Hamburg-American liner on August 3rd, and will land its passengers to attend the International Medical Congress in London from August 6th to 12th. It will then go on to Scarborough, Leith (for Edinburgh and the Scottish lakes), Aberdeen, the Hebrides, Glasgow, Belfast, Dublin, the Channel Islands, and Rotterdam, reaching Hamburg again on August 28th. The address of the committee is Berlin, W., 9, Potsdamstrasse, 134 b.

VERONAL POISONING.

Veronal, or di-ethyl barbituric acid, has been very extensively used as a hypnotic during the past few years. It was placed on the market as a harmless hypnotic by the German chemists who introduced it, and it is only as the result of numerous fatalities following its use that the dangerous properties of the drug have become recognized.

Cases of veronal poisoning are becoming increasingly frequent in this country, and there must be few medical men in practice who have not seen most alarming if not even fatal symptoms as the result of taking this potent drug.

Very many medical men have come to look upon the drug as a dangerous hypnotic, and on this account a large number of practitioners have wisely discontinued its use. It is, however, of urgent importance that the public should be protected against themselves, since veronal and drugs of this character can be freely bought from pharmacists and, indeed, from any one who chooses to sell them. The drugs need not be labelled poisonous and there is nothing to warn the purchaser of the danger from taking an excessive dose.

Organic chemistry has made such rapid strides during the last few years that as soon as a drug like veronal is placed on the market numerous derivatives and homologues are manufactured, and these in like manner are introduced, some special virtue being usually ascribed to the modification of the parent drug.

In the case of veronal a considerable number of derivatives have already been introduced, which may have a similar dangerous effect on the human body. Among derivatives are—medinal (the sodium compound of veronal), proponal (di-propyl barbituric acid), luminal (phenyl ethyl barbituric acid), luminal sodium, etc., while adalin and bromural are related to veronal in composition.

It is a matter of most urgent public importance that not only veronal but the allied drugs should forthwith be placed upon the poisons schedule.

In the case of veronal and the allied drugs there is to be considered not only the risk of fatal consequences following the use of these compounds, but, what is of equal importance, the great danger resulting from the acquisition of the drug habit.

Veronal is a drug which if taken regularly produces grave disorder of the nervous system, such symptoms as ataxy, hallucinations, and tremor being very marked. In addition a deterioration of the moral sense occurs, just as in the case of the morphine and cocaine habits. It thus follows that in those who have acquired the veronal habit a recklessness in the use of the drug may result, so that dangerous poisoning, often the result of a deliberate overdose self-administered, is the consequence.

In the recent inquiry at Hove in the case of Hugh Eric Trevanion, deceased, it was determined that about thirty-two hours before death a dose of approximately 150 grains of veronal was taken. The jury in this case showed a very intelligent appreciation of the dangers to which the public were exposed by the valuable riders appended to their verdict as follows:

1. That veronal, its derivatives, and allied substances should forthwith be placed on the poisons schedule.
2. That it be illegal to supply any hypnotic drug without the prescription of a medical man.

This case was of considerable value, since it called attention to many of the important toxicological features relating to veronal poisoning. Veronal is only slightly soluble in cold water, so that a large fatal dose would require a considerable quantity of liquid for its administration, about 2½ pints of cold aqueous liquid being required to dissolve 150 grains. In the case of hot water about three-quarters of a pint of liquid would be required to dissolve this amount, supposing it to be drunk in hot solution.

Medinal, the sodium compound of veronal, is very soluble in water, and 150 grains would dissolve in 2½ oz. of cold water. In the case of veronal and medinal, the solutions of the drugs have a bitter, nauseous taste, which would be easily recognized.

It is thus seen that veronal cannot be easily administered with homicidal intent without the person taking the drug being aware of the fact that a nauseous substance is

being given him, which in a normal person would give rise to suspicion. No doubt a large dose of veronal might be purposely given to a veronal taker instead of a moderate dose without his being aware of the fact at the time.

The determination of the fatal dose of veronal in a case of fatal poisoning is a matter of some difficulty, because death does not, as a rule, occur within twenty-four hours, and during the period intervening before death a considerable quantity of the drug would be excreted in the urine. Probably only about one half of the dose taken would be present in the body at the time of death.

Veronal when absorbed appears to be evenly distributed over the various organs of the body. There is not that special selection of absorption by particular organs which is characteristic of many poisons. Hence in calculating the amount present in the body at the time of death the total weight of the soft tissues must be estimated, and the total poison in the body is calculated from the proportionate amount found in a given weight of the organs examined.

Veronal being an acid is extracted by ether from the acid solution obtained by the Stas process of extraction for alkaloids. The poison is recognized by its characteristic crystalline appearance and physical properties, and also by special chemical tests.

The Council of the Pharmaceutical Society, at its meeting on March 5th, acting under the Pharmacy Acts, 1868 and 1908, adopted the following resolution:

> That diethyl-barbituric acid and other alkyl, aryl, or metallic derivatives of barbituric acid, whether described as veronal, proponal, medinal, or by any other trade name, mark or designation; and all poisonous urethanes and ureides ought to be deemed poisons within the meaning of the Pharmacy Act, 1868, as amended by the Poisons and Pharmacy Act, 1908, and ought to be deemed poisons in the Second Part of the "Schedule of Poisons" to that Act.

FINAL REPORT OF THE COMMITTEE ON TUBERCULOSIS.

THE Departmental Committee on Tuberculosis, of which Mr. Waldorf Astor, M.P., was Chairman, has issued its final report.[1]

THE PRESENT POSITION.

It is pointed out that since the interim report was presented in April, 1912, two important changes affecting the funds available for the campaign against tuberculosis have been made; the first was the announcement in the letter of the Chancellor of the Exchequer of July 31st, to Mr. Henry Hobhouse, Chairman of the County Councils Association, that the Treasury would meet approximately half the estimated cost of treating non-insured persons as well as the dependants of insured persons. The Committee holds strongly that no campaign against tuberculosis could have had a reasonable prospect of success if provision were made for the treatment of a section only of the population. The second change referred to is the allocation for domiciliary treatment of 6d. per insured person out of the 1s. 3d. provided by Section 16 of the Insurance Act.

THE PURPOSE OF THE PRESENT REPORT.

The final report now presented deals mainly with the measures which in the opinion of the Committee should be taken for the prevention of tuberculosis in general, with special reference to the questions relating to bovine tuberculosis and tuberculosis in children, and to a scheme for dealing with the annual sum of money available in the hands of the Insurance Commissioners under Section 16 (2) of the National Insurance Act for the purposes of research.

PREVENTION.

Prevention of the Entrance of Tubercle Bacilli.

The Committee believes that by means of treatment and education the risk of infection, even from persons in the more acute and advanced stage of the disease who live in intimate contact with others, may be largely diminished. Infection is frequently disseminated by persons suffering from advanced pulmonary tuberculosis who are in the habit of entering and leaving Poor Law institutions, having regard merely to their own convenience, and not to the interests of their family or of the community in which they live.

The Committee recommends the compulsory isolation of certain cases in a state of high infectivity, particularly when the patient's surroundings are such as to increase the risk of other persons becoming infected. It recognizes that such isolation should be carried out with all possible regard to the feelings of the patients and their families and friends.

The systematic and thorough disinfection of premises which harbour tubercle bacilli is mentioned, and stress is laid on the importance of early diagnosis of the disease.

Prevention of Development of Active Disease in Persons Infected.

The Committee believes that material prosperity of the community as a whole will be reflected in a decreased incidence of tuberculosis, and makes special reference to the necessity for the improvement of housing conditions, and the value of schemes for town planning and garden cities.

BOVINE TUBERCULOSIS.

The Committee is of opinion that the ultimate eradication of animal tuberculosis is not impossible of achievement, but is likely to be a slow process, and must depend upon co-ordinated and continuous effort. No single or purely local effort will suffice. The Committee, while welcoming the proposed legislation dealing with the question of the milk supplies, expresses the opinion that it should include the whole country, and should contain provisions conferring special powers upon local authorities, the central authority having the right of enforcement in the event of default by local authorities. It recommends that in the preparation of any scheme for the eradication of bovine tuberculosis the following points should be provided for:

1. County councils and county borough councils should have powers and be required to inspect herds, dairies, and farm buildings and to administer all enactments relating thereto, their work being subject to adequate supervision by a central authority. As regards the local inspecting authorities, this recommendation may require some modification in Scotland where local government is somewhat differently organized.
2. Only guaranteed tuberculin should be used, and facilities should be given, subject to such conditions as may be thought desirable, for the free testing of cows by qualified and authorized persons.
3. Certain cows should be slaughtered, both in the interest of the public and of the dairy industry, the premises thoroughly disinfected, and no tuberculous animals added to the herd.
4. Measures should be uniform in character and the same principles should be applied to the whole country.
5. The public should be educated so as to appreciate the greater value of pure tubercle-free milk and milk products.
6. Farmers should be taught that tuberculosis in cattle is infectious and not hereditary.

CHILDREN.

The Committee considers the evidence that children are infected through tuberculous milk, as well as from other sources, convincing, and makes the following general observations:

The Committee are of opinion that additional provision is required for the treatment of children suffering from the disease, including cases of pulmonary tuberculosis, tuberculosis in the bones and joints, and glandular and other forms of tuberculosis.

In addition to the provision of treatment at sanatoriums and hospitals for tuberculous children mentioned in the Interim Report, there is urgent need for a wide application of the principle of open-air treatment and education by means of open air schools (day and residential), open-air classes, etc. Such institutions should deal not only with tuberculous children, but also with the large number of children who are suffering from ailments which, if neglected, would be likely to increase their susceptibility to tuberculosis. It is also desirable that these institutions should be utilized, as far as possible, to teach the advisability of the adoption of a practically open-air life in the homes of the children.

It is of opinion, further, that the school medical officer should be closely in touch with the family medical attendant, and that the tuberculosis dispensary should as far as possible provide the same service for children as for adults, and continues as follows:

There should not only be a correlation between the dispensary and the various institutions for children, but the institutions

[1] Final Report of the Departmental Committee on Tuberculosis. Vol. I (Cd. 6641). Price 2½d. Vol. II, Appendix containing memorandum on sanatoriums prepared by a subcommittee, and various memorandums by witnesses. (Cd. 6654.) Price 1s. 7½d. To be obtained through any bookseller.

for children, such as the school clinic, the open-air school, and the sanatorium, should be correlated one with another in order to ensure the easy transference of children from one institution to another.

All appropriate cases should be referred to the tuberculosis dispensary as a clearing house for the confirmation of diagnosis in doubtful cases, for the purpose of clinical record and for treatment where required. Children of school age fit, or likely to become fit, to receive education, even in modified form, should be referred to the school medical officer for education in open-air schools, sanatorium schools, or other special schools, or in ordinary public elementary schools under special care and supervision. The arrangements should be such as to secure the co-operation of the general practitioner.

Ireland.

The Committee expresses its regret that power to make tuberculosis compulsorily notifiable has not been conferred on the Local Government Board for Ireland, and the hope that the matter will receive the serious consideration of the Government, since compulsory notification is essential to any satisfactory scheme for dealing with the disease.

Research.

The Committee estimates that under Section 16 (2) of the Insurance Act, which enacts that the sum of 1d. per insured person, payable out of moneys provided by Parliament, may be retained by the Insurance Commissioners, in whole or in part, to be applied for the purpose of research, the sum available at present will be £57,000 a year, and that there may be a small increase in future years. The Committee recommends the establishment of an advisory council and an executive committee, and says:

The duties of the Advisory Council should be to advise, make suggestions, and submit the Executive Committee's budget to the Government, and to advise, criticise, and make suggestions to the Executive Committee.

The duties of the Executive Committee should be to frame a budget which should be discussed and considered with the Advisory Council before being submitted by the Council to the Government; to determine, after consultation with the Advisory Council, the scheme of research work; to make periodic reports to be transmitted by the Advisory Council to the Government; and generally to organize and supervise the research work wherever carried on.

It is evident that when first organizing the scheme both bodies will have to meet frequently, but that when the scheme is in operation there will be less demand on their time.

The Committee considers that the Executive Committee should have as a permanent whole-time secretary an expert of high standing in research, possessing administrative capacity and receiving a salary of £1,200 to £1,500 a year, and that he should, if practicable, act as secretary of the Advisory Council.

The inquiries contemplated by the Committee would include those of a clinical, pathological, experimental, statistical, and sociological character, and it recommends that every sanatorium, dispensary, and other institution for the treatment of tuberculosis and other diseases should have access to laboratory facilities for carrying out routine work and for the collection of data, adding that many of these institutions should have complete laboratories of their own, but that central organization and direction mean economy of time and money.

The Committee received evidence indicating that the funds available for research might be expended on a central bureau, on special institutes, in grants to approved institutions, in grants to individuals, in making special inquiries, and in scholarships and fellowships, and points out that the methods are not mutually exclusive. It recommends that the work should be instituted on the following, amongst other, lines:

(*a*) A central bureau should be established and should be the head quarters of the Advisory Council and Executive Committee. The central bureau should have a statistical and sociological department, in the work of which should be included the co-ordination and correlation of results. With regard to statistical investigations, every effort should be made to utilize, where possible, and co-operate with the statistical departments of the different Government departments. Statistics should be so collected and framed as to be comparable with the existing statistics of mortality.

There should also be a library and publishing department. The Central bureau should be under the immediate control of the Executive Committee.

(*b*) Clinical, pathological, bacteriological, chemical, and other scientific researches should be carried out by competent investigators employed by the Executive Committee in institutions approved by them.

(*c*) When the Government, on the recommendation of the Executive Committee, and after consulting the Advisory Council, deem such arrangements desirable, researches of the same nature as those referred to in the preceding paragraph should be carried out in an institution or institutions (including laboratories and hospital wards) which should be under the immediate control of the Executive Committee to the extent and for the purpose in question.

(*d*) Money should be available in order that special inquiries—for example, of a statistical and sociological nature—should be carried out by the Executive Committee, if necessary, independently of any particular institution.

(*e*) The question whether a sum of money, not exceeding £1,000 per annum, should be available as a prize or prizes for the best original research work done should be considered. The money should only be awarded if the discovery is of sufficient importance and utility.

The Committee recommends that some workers of proved ability should be enabled to devote their whole time to research work, should be given a definite adequate salary and be entitled to a pension, and that efforts should be made to retain young and talented investigators for such work. The Committee goes on to express the opinion that the success of the scheme of research recommended will not be fully secured unless it is accompanied by a general extension throughout the United Kingdom of clinical laboratories for the better diagnosis and treatment of the disease, provided out of funds other than those available under Section 16 (2) of the National Insurance Act.

Medical Education.

The Committee is of opinion that additional facilities should be afforded to medical students and practitioners to acquire familiarity with the methods of diagnosis of tuberculosis, more especially in its earlier manifestations, and with the methods of treatment, and makes the following recommendations:

1. Medical students and practitioners should be afforded facilities to attend the practice at tuberculosis dispensaries, sanatoriums, and other institutions.
2. It is advisable that tuberculosis dispensaries should, where possible, be directly associated with schools of medicine.

The recommendations in regard to research are further discussed in a leading article at page 571.

FREE CHOICE OF DOCTOR.

Few experiences are more interesting than that of watching the birth, growth, and full fruition of an idea. To see it taking shape in word, on paper, and in deed is interesting in itself, and this interest is increased when comparison is made with the many ideas which only see the light to die, or having looked upon the sun are blighted and come to an untimely end.

It is with this feeling of deep interest that the medical profession has watched the birth and the ups and downs of the great idea of free choice of doctor. Had it remained in medical hands it would have been to-day a fine, full-grown, clean-limbed embodiment of a great idea, but, unfortunately, the politicians laid rude hands upon it and knocked it about to suit their own purposes, so that now it issues from the political arena so unlike what was expected from its promising inception, that its parents are disposed to disown their child.

Let us follow the progress and fate of this idea. Free choice of doctor—the freedom of the patient to choose his own doctor and the right of the doctor to choose his own patient—was not mentioned by the Chancellor of the Exchequer when, nearly two years ago, he introduced the National Insurance Bill. Two reasons may be assigned for this important omission: First, that he had determined to compel the doctors to accept his own terms; and, secondly, that he was obsessed by the fear that the British working man would ruin the insurance fund by malingering. This latter is, we believe, so far as the vast majority of insured persons are concerned, an unfounded fear, and comes badly from one who is never tired of shouting the battle-cry, "Trust the people." But although

the Chancellor of the Exchequer said no word about free choice of doctor in his speech introducing the bill, the subject was brought up (during the debate on the introduction) by Lord Alexander Thynne, who said:

> You must either give a free choice to the patient to choose any doctor he likes in the district, or you must give him a choice of what I may term "a panel of doctors."

On the second reading debate Dr. Addison contended that

> There should be provision for enabling patients to choose their own doctor. . . .

And the Chancellor said:

> There is nothing (in the bill) to prevent the free choice of doctor.

Evidently, then, both sides of the House were agreed that there should be free choice of doctor. The profession's approval was voiced when the British Medical Association, through a deputation to the Chancellor of the Exchequer on May 30th, 1911, submitted:

> That it should be open to every medical practitioner in the district, who is willing to act, to be on the list from which insured persons might make choice, provided that such practitioner had not been guilty of misconduct justifying his exclusion from the list.

Here we note that the service must be a willing service —"every practitioner . . . who is willing to act"—the underlying hope being that the terms and conditions offered to the doctors would be so reasonable that they would willingly and sympathetically do everything in their power to make the Act a success. Two days after, at the Special Representative Meeting, the Chancellor of the Exchequer, speaking of the free choice of doctor, said:

> Personally I am strongly in favour of it. . . . I think one of the essentials of curing is that the patient should have faith in his doctor, and you cannot have faith in your doctor if you have doctors thrust upon you whom you have not chosen. . . . Therefore I am myself strongly in favour of the system . . . of setting up a panel on which all qualified medical practitioners will be able to serve—not compelled to serve, no doctor will be obliged to take this work. . . . I should be delighted to see a free panel of doctors set up under the care of the local doctors themselves.

This in plain and unmistakable language is a declaration in favour of freedom for the doctor who will not be compelled to serve and for the patient who will not have doctors thrust upon him. Words, words, words! By the Act and Regulations the faith of the patient in his own doctor and the willing service of the doctor have been both thrust aside with ruthless hands, and in the name of liberty a Liberal Government

> "plays such fantastic pranks before high heaven
> As make the angels weep."

Again, in October, 1911, Mr. Lloyd George made a speech at Whitefield's Tabernacle, in which he said, among many other things:

> The first thing that happens is that he (the insured person) can have free medical attendance. . . . Under this bill he can have the doctor of his choice. . . . So we say to him, Go to the doctor you believe in. . . . That is the first thing that happens; he can go to the doctor whom he believes in, and every doctor who chooses can go on the panel. So there is not only free choice for the patient, there is free choice for the doctor as well. We are going to make this really a free country.

But as time went on the Chancellor of the Exchequer began to see that the conditions and terms of service were not acceptable to the doctors, and that he had more difficulty in bringing them to heel than he expected. So he began to hint that a Local Insurance Committee might be free to organize a service in some other way, and that there must be a limit to free choice of doctor. Hence we are not astonished that when the revised form of the paragraph dealing with this matter came up for debate in the House he went a step further. Mr. Ramsay Macdonald had said:

> I cannot see what objection, what sound and serious objection, there really is to allowing each insured person to have his own doctor.

Mr. Lloyd George replied:

> There is nothing in the bill to prevent free choice of doctors. On the contrary, I am all for free choice of doctor, *within limits*. If you give an *unlimited free choice of doctors*, you are taking the direct road to promote malingering. . . . We have so framed our measure that free choice of doctors is allowed. [The italics are ours.]

It is easy for him after this to say, "If he (the working man) gets a good doctor, I do not think he cares whether it is Dr. Smith or Dr. Brown." From this to

> No insured person is allowed to make any bargain outside the panel unless it is allowed by the Local Insurance Committee; let that be perfectly clear.

is an easy step in the descent.

Yet another step on the downward course. The insured person was to have not his own doctor truly, but a good doctor, and with that he must be satisfied; the Chancellor of the Exchequer hath said it. In his last speech, however, he gives up the "good doctor," and we reach the bottom of the incline in this utterance: "We cannot guarantee the quality of any doctor. There are good and bad doctors, and some in between . . . but we cannot guarantee them."

MOTOR CARS FOR MEDICAL MEN.

CHEAPER FUEL.

THE British Motor Cab Company has made successful experiments with a mixture of paraffin and petrol, in which the latter forms less than one-half. The objection to paraffin has been that it was useless for the purpose of starting. This difficulty appears to have been overcome by an apparatus supplied with pure petrol from a small independent tank, used only for the purpose of starting. Mr. Worby Beaumont has reported to the Royal Automobile Club that the apparatus is simple, effective, and not liable either to derangement, or to be the cause of danger, and that it is applicable to any kind of petrol engine used in motor vehicles.

CHEAP MOTORING FOR MEDICAL MEN.

Dr. A. Mackenzie (Leeds) writes in praise of the Scott motor bicycle with side-car attachment, which he considers is, even apart from the question of expense, as useful to a medical man as a car. He likes its appearance, and finds that it is not necessary to wear overalls, that it is silent, handy in traffic, and easily started. He adds that it is, in his judgement, an excellent machine for a middle-aged man. He has ridden his own machine over 4,000 miles and has used it every day since he got it, and it has not required any repairs.

NAPIER MOTORS, LIMITED.

The firm of Messrs. D. Napier and Sons, Limited, which began business in 1808, has acquired the business of S. F. Edge, Limited, and the business will in future be known as Napier Motors Limited. The Napier works, which are situated in London, make a large variety of vehicles, ranging from the small four-cylinder, 15-h.p., to the large six-cylinder, and in business vehicles from 12 cwt. to 2 tons.

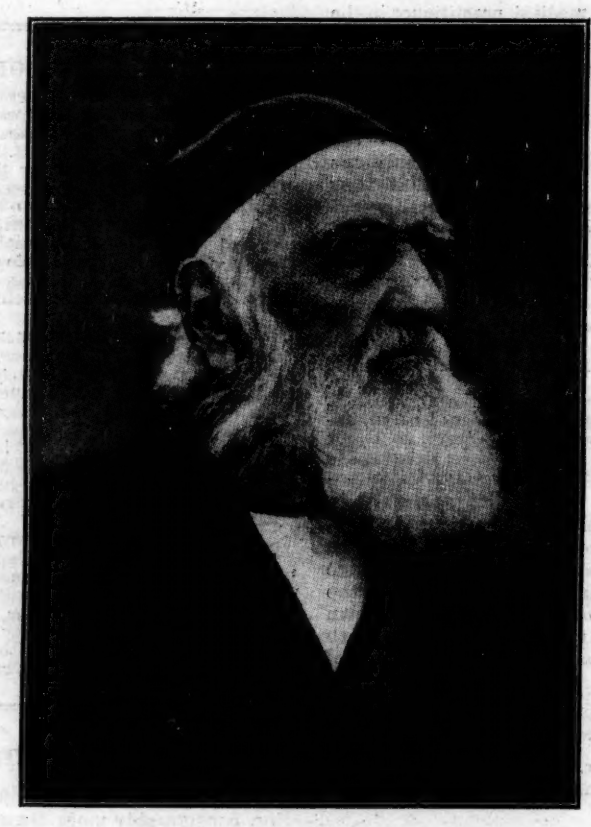
A NESTOR OF THE PROFESSION.

[BY OUR SOUTH AUSTRALIAN CORRESPONDENT.]

FOR considerably more than a generation Surgeon-Major Hinton has been one of the personalities of Adelaide and of South Australia generally, and yet he has been but little known outside his own family, except to myself, and to the librarians of the various public libraries. Short and somewhat rotund (not in the least military looking), with an ample white beard, a quaint figure in a sola topee and a tight-buttoned cotton suit reminiscent of India, till about a year ago Dr. Hinton might be seen doing a constitutional of some six or eight miles every day. He had no very fixed place of abode; it is said that at various hotels his demeanour towards the domestics was too suggestive of "India's coral strand," and that it was resented by the democratic instincts of the Australian "help"; landladies, indeed, had sometimes to suggest a change to pastures new. Some year and a half ago he had the misfortune to trip and sustain an intracapsular fracture of the left hip, and since this accident he has come to anchor in a rest home in North Adelaide, generally devoted to the worship of Lucina. Here he devours the latest books and current magazines, reading them without glasses, in possession of all his faculties with the exception that he is deaf. He seems to be enjoying the late autumn of his life, and he affords an illustration of the well-known longevity of pensioners, for he attained to the centenary of his birth on March 7th, 1913. A small eater, a non-smoker, and

almost a total abstainer, he thinks with Metchnikoff that life may be indefinitely prolonged. When a sprightly young nonogenarian he was startled one day to read in the paper that Surgeon Hinton of the Indian Army had died a centenarian and the oldest member of the profession in Great Britain; this namesake he had never met, nor even heard of; now he seems to have succeeded to the vacancy, unless there be living still men who "qualified" before March 25th, 1835.

Henry Benjamin Hinton came of a long-lived family; both his parents lived to be over 80, and two sisters were nonogenarians. He was born at Southsea, his father, who belonged to the Baptist Church, being the cashier of a local bank. He was at school at Portsmouth till the age of 15, when he began life with a cousin, Isaac Hinton, a publisher, in Warwick Square; the reading of Sir Walter Scott's *Chronicles of the Canongate* first inspired him with interest in India, and he resolved, with his father's permission, to become a surgeon. He was apprenticed for five years to a Mr. S. Cumming of Limehouse, whose wife was alleged to be a descendant of James II. He suffered from headaches due to myopia, and had to wear glasses till he was 50, when a beneficent presbyopia came to his aid. In October, 1832, he commenced work at the London Hospital, attending the systematic lectures delivered by Dr. Pereira. In October, 1834, he entered at Westminster Hospital under Guthrie, the Peninsular and Waterloo veteran, who had seven years earlier published his book *On Gunshot Wounds*, by which and as the founder of the Westminster Ophthalmic Hospital his name is still remembered; the lecturer on medicine was Dr. Ryan, on botany Dr. Epps, and on surgery Dr. McDermott. The most distinguished of his fellow students in after-life was Joseph Toynbee, the aurist, who was the father of the founder of Toynbee Hall; James Hinton, also a well-known aurist in his day, was his cousin. Mr. Hinton's own examination for the M.R.C.S. appears to have been wholly viva voce, and to have been over in one evening; Sir William Blizzard was one of his examiners.



SURGEON-MAJOR HINTON.

No sooner had he received his diploma than he obtained the surgeoncy to an East Indiaman, the *Broxholme*, of 800 tons, and in her he made three annual voyages to Calcutta, a passage taking then about five months; the captain of his ship used his influence with the East India Company to obtain for him a nomination as assistant surgeon in the Bengal Army, and on his return to India he was gazetted on May 28th, 1839, to the 21st Fusiliers at Chinsurah, where his first important duty seems to have been attendance at the flogging of a soldier for some trivial offence. In December, 1839, he volunteered for service in Arracan, and had charge of a native regiment; with it he returned to Bengal in 1841, but in the same year went again to Arracan in a civil capacity. Remittent fever caused his transfer on sick leave to Bengal again, and in 1843 he rejoined his regiment (the 65th N. I.) at Dinapur. In December of that year he was ordered to join the army of Gwalior, but travelling in those days was slow, and when he arrived at Agra he learnt that he was too late to take part in the battle of Maharajpore, in which Sir Hugh Gough routed the Mahrattas; however, he assisted to attend to the wounded, and only failed to receive the Bronze Star awarded for that campaign on account of professional differences with a superior officer. And here I may remark, if one may rely upon the perusal of Surgeon-Major Hinton's autobiography, that he seems not infrequently to have fallen foul of his superior officers with the usual inevitable result. The defeated enemy was strangely enough converted into the Gwalior Contingent, and to the 4th Infantry Regiment thereof Mr. Hinton was gazetted, and subsequently to the 7th Infantry.

In January, 1846, the banks of the Sutlej were the theatre of war, and Surgeon Hinton served through the greater part of the First Sikh Campaign, though he missed the disasters of Moodkee and Ferozeshah. He served under Sir Harry Smith at Aliwal in January, 1845, and fought under him again at Sabraon next month. After this campaign he was sent in charge of invalids to Meerut. Incompatibility of temperament with a senior officer led to his transfer to the 51st N.I. in Ferozepur in 1846. Then he obtained a garrison appointment at Delhi in January, 1847, where he saw the aged and feeble emperor (Bahadur Shah) in a bath chair.

The Sikhs were defeated, but not vanquished, and it fell to Dr. Hinton's lot once more to serve under Lord Gough in 1848 to 1849, and take part in the crowning mercy of Goojerat with the 32nd N.I. He was afterwards stationed at Wuzeerabad, where his medical duties appear to have been combined with the oversight of the post-office, and here again he succeeded in falling foul of the leading officials. Amongst other unpardonable offences he seems to have attended a church parade in a white jacket instead of a red. February, 1854, found him in Goruckpore, and in 1856 he was stationed at Bowsee, where next year they experienced a foretaste of the mutiny, and later on the reality. The 32nd N.I. was marched to Raneegunge to be disarmed, and only by the miscarriage of a native's letter did its officers escape being massacred on the road. This was all Surgeon Hinton saw of the mutiny, but it was touch and go. In November, 1857, one of the disarmed native regiments (the 70th), to show their loyalty, volunteered for service in China, and Surgeon-Major Hinton changed into it shortly after, landing at Canton in April, 1858, where he served for two years. After the China war seven more years were served in India, but these were comparatively uneventful; thus closed a strenuous life of twenty-nine years in India, during which much history was being made, and many geographical boundaries were altered. For some forty-five years he has drawn his pension; long may he continue to do so in comfort!

THE mental hygiene exhibit prepared for the International Congress of Hygiene in Philadelphia includes charts, photographs, and models illustrating past and present methods of treating the insane.

ACCORDING to the *Boston Medical and Surgical Journal*, the New York Supreme Court has upheld on appeal the conviction of a driver of a milk wagon for having in his possession unwashed milk bottles. The employer contended that the statute which made this an offence was unreasonable and drastic, but the court said "the danger to be apprehended from the use of unclean receptacles for milk intended for human food is so well known that drastic measures to prevent the possibility of such use are reasonable and justifiable."

British Medical Journal.

SATURDAY, MARCH 15TH, 1913.

THE INSURANCE ACT AND RESEARCH.

AMIDST the turmoil of controversy regarding the Insurance Act, the fact has almost been lost sight of that it provides the first great contribution from the State towards research in scientific medicine. By Section 16 (2), one penny per insured person, payable out of the moneys provided by Parliament, may be retained by the Insurance Commissioners to be applied for the purposes of research, and the total sum thus available will at present amount to about £57,000 per annum. While the main concern of this part of the Act is to combat tuberculosis, the Commissioners have been advised that the money may properly be applied to research in connexion with any disease which may affect insured persons.

A year ago a Treasury Committee was appointed to advise the Government and local bodies on the problem of tuberculosis in the United Kingdom in its preventive, curative, and other aspects, and an interim report was issued last April dealing with the practical measures to be adopted in combating the disease. The recommendations therein contained regarding the establishment of dispensaries, sanatoriums, and hospitals, seem to have found very general acceptance, and are being widely followed by local authorities in carrying out the Act. In a final report just presented to the Treasury, the whole ground of the reference is covered and a scheme for the administration of the research fund promulgated. The Committee did not include any representatives of those actively engaged in scientific work in human pathology. Thus, although heads of various laboratories in the kingdom were invited to give evidence, most of the members of the Committee in dealing with the question of research must have found themselves on very unfamiliar ground and have been in the position of a criminal lawyer called on to sift the evidence in a complicated patent case. The recommendations of the Committee must thus be looked on as of a preliminary and tentative character, but they may form a foundation upon which a successful scheme can be established.

In looking at the scheme of the Committee certain general considerations must be kept in view. The attack on tuberculosis is, next to that on cancer, probably the most complex task which scientific medicine has ever had to face, as is evidenced by the slowness with which practical results have been obtained, notwithstanding the immense amount of work already done. The disease has its own peculiar problems, such as those relating to the channels by which infection occurs and to the existence or non-existence of immunity towards it. From the standpoint of pathology in its practical application to the problem tuberculosis must be regarded as one member of the group of infections, and facts gleaned from work on different members of the group have led to the emergence of the principle that certain great general processes are common to all infections. These have to do with such matters as the factors by which the causal organisms are enabled to multiply in the body, to the essential pathological changes underlying fever, and to the phenomena of recovery. Many facts support the view that once any of these common processes is elucidated for one disease, the explanation will be very generally applicable in other affections. It is to be noted that tuberculosis is in many ways a disease unsuitable to afford opportunity for the solution of the common problems of infection, chiefly because when a question is put the slow development of morbid lesions delays the answer. This opinion finds support in the fact that in institutes largely devoted to general investigations on infection, such as the Rockefeller, and even the Pasteur Institute, comparatively little work has hitherto been done on tuberculosis. Such considerations as these are important in their bearing on the present scheme, for it follows from them that every research which advances knowledge of infection, *ipso facto* throws light on tuberculosis. The Committee anticipates that for the present the moneys available will be applied to research in connexion with tuberculosis and allied problems. It is, however, of the highest importance to realize that, as has been stated, the money can be devoted to diseases of insured persons other than tuberculosis, and we trust that the broader investigation of infection as a whole which is thereby rendered possible will from the outset be brought into the programme of research.

The principle laid down by the Committee, that in any scheme the aim should be to stimulate and to co-operate with existing voluntary agencies for research, is thoroughly sound, as also is the practical application that "clinical, pathological, bacteriological, chemical, and other scientific researches should be carried out by competent investigators employed by the Executive Committee in institutions approved by them." The way is thus at once opened for the organization of the work in the medical schools of the country. These schools must in any case provide the corps of workers required, and it is well to recognize that the existing resources will require augmentation. Putting clinicians aside, there are at present probably not more than 150 men engaged in research work in medicine in the country. One reason for the fewness of the labourers is that many men who have a leaning to research must perforce enter practice to gain a livelihood. The research scheme, with the future development of permanent appointments to which it will inevitably lead, will direct the best talent into channels where it will be best utilized. The working of the scheme through existing laboratories will further place at the command of the Government the wide experience of research possessed by the heads of these institutions, and will facilitate the organization of co-operative effort by different branches of science all over the kingdom. Again, the whole clinical material of the country will be available for investigation, and the routine work of local administrative bodies, such as that relating to the supply of tubercle-free milk, will be co-ordinated with higher scientific work. The distribution of work will also have another far-reaching effect which is not immediately obvious. It is important that the practitioners who are in charge of the insured should recognize the value of, and be inspired by the results of, research. Such a spirit can only be developed if the teachers of medicine and pathology with whom medical students come in contact are active participants in the work which is going forward.

Certain points in connexion with the machinery of administration call for comment. While no objection can be taken to the setting up of two bodies, one,

the Advisory Council—representing general interests, governmental, educational, and scientific, and the other, the Executive Committee, composed chiefly of experts, the proposed relations of these two bodies to one another are unusual. Both are to be appointed by the Government, but apparently the Advisory Council has no control over the Executive beyond offering advice and criticism and transmitting its proposals to the Government. In fact, it would appear to be intended by the Committee that in the particular event of the Executive wishing to arrange for research under its own control, it should have the power of approaching the Government direct. Thus, in case of a difference between the two bodies, an unfortunate Minister might be called on himself to settle whether some line of research should or should not be pursued. It seems obvious that even if the Committee's suggestions were adopted in their present form, no differentiation should be made between the various proposals of the Executive so far as the channel of approach to the Government is concerned. The Committee's plan for defining the functions of the two administrative bodies should be considerably modified. The committee of experts (which might either be an independent body or a subcommittee of the larger body) should submit its proposals for any year to the larger body (constituted as recommended in the Report) for consideration and, possibly, for amendment. A matured scheme would thus go to the Government with the weight attaching to its recommendation by a board on which all views on the subject were represented, and any subsequent discussion regarding it should take place between the Government and the larger body. When finally adjusted, the scheme could come back to the experts to be carried out. Another proposal, to which exception may be taken, is that the Executive should have as secretary a highly-paid expert of high standing in research. Why, with a wealth of expert opinion on the Executive, an individual of this kind should be asked to spend his time in performing administrative duties is not at all apparent. On the other hand, the recommendation of the Report that statistical and sociological inquiries should be directly under the control of the Executive and should be carried on in a central bureau will probably meet with general approval. Such inquiries constitute almost the only department of work relating to tuberculosis where centralization is necessary to efficiency.

While we are of opinion that the recommendations of the Tuberculosis Committee as a whole furnish a basis on which a successful edifice can be built, we cannot conceal from ourselves the fact that the next steps to be taken are of the most critical nature. Unless they are tentative, and unless the unknown resources of the country are most carefully investigated, this great movement may end in disastrous failure. The mere offer of such a large sum of money is in itself a temptation to useless and ill-considered prodigality, and we doubt whether, in saying that the whole of the moneys could usefully be spent in research on tuberculosis, the Committee has fully realized the magnitude of the question it was asked to advise upon.

We hope to return to the subject in an early issue, and to point out what we consider to be some of the dangers underlying the research scheme, and some of the opportunities which a wise statesmanship will find in it. Meantime we would strongly urge the appointment of a body having the constitution of what the Committee describes as the Advisory Council. This body will necessarily include representatives of those actually engaged in research and could consider the whole situation before an executive is appointed or any definite plans as to actual research are framed.

ADRENALIN MYDRIASIS IN DIAGNOSIS.

DR. CORDS of Bonn has recently collected[1] all that is known of the dilating action of adrenalin upon the eye of man and the lower animals, and has added to a masterly summary of the work of others an account of his investigations.

In 1898 Radziejewski was the first to test the action of a 10 per cent. extract of the adrenal bodies when instilled into the human conjunctival sac; in no one of 500 persons did he detect any effect upon the size of the pupils or upon accommodation. Lewadowski showed in 1898 that when adrenalin was injected into the veins of cats the effects produced—mydriasis, slight exophthalmos, and slight widening of the palpebral slit—were the same as those which follow stimulation of the cervical sympathetic. These changes were not neutralized by eserine. Other observers showed that subconjunctival injection of adrenalin caused mydriasis in man, and instillation dilated the pupil if the cornea were ulcerated or otherwise rendered more permeable. In other words, the physiological effect was dependent on the amount of adrenalin which reached the iris; the normal cornea was not sufficiently permeable, but a wounded cornea allowed enough to transfuse. Subsequently, Wessley found that the repeated instillation of a strong solution dilated the pupil even with a normal cornea. Meltzer and Clara Meltzer Auer showed that the action was greater after extirpation of the superior cervical ganglion than after subganglionic division of the nerve or than in a normal animal. It has since been discovered that this increased sensibility soon disappears, and that some days later no difference can be detected between the side with and without the ganglion. The seat of action is probably, as Langley has suggested, in the receptive substance of the dilator muscle. The mydriasis is most certainly not due to vasomotor action. The eye of the frog is so sensitive to adrenalin that it may be used to detect the presence of minimal amounts of the substance.

Cords understands by adrenalin mydriasis a dilatation produced with intact cornea by a single or repeated instillation of a 1 in 1,000 solution of the drug. In using the test it is best to make three instillations in five minutes and then close the eyes for ten minutes. It is well to make the observations in a subdued light. The cornea must be carefully examined for small defects or a source of error may be overlooked. Adrenalin mydriasis is observed in all conditions which are associated with increased excitability of the sympathetic system. All states of the body in which the equilibrium of the internal secretions (hormones) are disturbed in the sense of an excess of the chromaffine system are associated with an increased sensibility to adrenalin. Such conditions are—functional disturbance of the pancreas, overaction of the thyroid gland, diabetes mellitus, and perhaps exophthalmic goitre. These facts were pointed out by Loewi, and the effect is known as "Loewi's sign." It is probable that in all these states the adrenalin content of the blood is increased

[1] *Die Adrenalin mydriasis und ihre diagnostische Bedeutung.* Von Richard Cords in Bonn a. Rh. Wiesbaden: J. F. Bergmann. Glasgow: F. Bauermeister. 1911. (Sup. roy. 8vo, pp. 62. Price unbound, Mk.1.60.)

Unfortunately the sign is very inconstant. Some cases of diabetes show it, others do not, nor has the severity of the disease any effect upon the reaction. It may be given by mild cases of diabetes, may be absent in severe, and the reverse is equally true. In abdominal lesions such as peritonitis and injuries to the intestines the sign is sometimes obtained and is probably due to an increased amount of adrenalin in the blood.

The fact that prompt mydriasis follows the instillation of adrenalin into the eyes of animals whose superior cervical ganglion has been recently removed is of especial interest. The operation causes an enormously increased excitability of the receptive substance (Langley) in the dilator muscle cells. The same phenomenon has often been observed in man. Preganglionic division of the sympathetic nerve has no such action.

The reaction may help in the exact localization of the seat of the lesion, causing paralysis of the fifth nerve. The sympathetic joins this only a few millimetres on the distal side of the ganglion, and the sympathetic enters the orbit combined with the first division of the fifth nerve. If complete paralysis is caused by a lesion distal to the junction of the two nerves, the sympathetic is generally paralysed as well and adrenalin mydriasis is present. If the lesion is proximal to the junction—as in most cases of fifth nerve paralysis caused by cerebral syphilis at the base of the brain—no dilatation of the pupil follows the use of adrenalin. Cords failed to obtain the reaction in such a case of complete paralysis of all the divisions of both trigeminal nerves. The sign is, however, inconstant. Six cases of paralysis of the fifth nerve are cited associated with sympathetic paralysis, in which no adrenalin mydriasis was obtained. It would appear that a post-ganglionic lesion of the sympathetic frees the dilator from the inhibitory action of the superior cervical ganglion, and so enables adrenalin mydriasis to occur.

In adrenalin, therefore, we possess a diagnostic aid which, though uncertain and inconstant, may yet be of great help in a difficult case. The positive action of the drug is of much more value than failure in action.

ALIMENTARY TOXAEMIA.

DR. JOHN BROWN, in his lay sermons on health to working people, told a story of an odd old man at Greenock who left at his death a number of sealed packets to his friends; on opening them they found a Bible, £50, and a box of pills with the words, "Fear God, and keep your bowels open." It is a never ending source of astonishment to the medical profession that this apparently simple function can be so grossly neglected. Corporate bodies and municipal councils and communities will spend any amount of time and money in elaborating the drainage system of their town, yet the individual members may be, and often are, guilty of the grossest sins of omission in the care of their own drainage system. Some of these sins of the public may possibly be laid at the door of the medical profession, which has sometimes been apt to deal with the poisonous conditions which arise as the result of constipation in a too haphazard fashion; scientific study of the matter is only in recent years finding its true place. Bacteriology, and surgery also, thanks largely to Mr. Arbuthnot Lane, have shown that the range of troubles which may be attributed to this auto-intoxication is much wider than used to be generally recognized.

The discussion on alimentary toxaemia, opened at the Royal Society of Medicine last Monday, has been very happily timed; Dr. Hale White's introductory paper is full of suggestions and points the way along which inquiry must go. He assails at once the term "alimentary toxaemia." It is a term which shows our ignorance, since it simply indicates the route of entry of the poison. It implies that the illness is due to poisons manufactured by micro-organisms resident in the alimentary canal, but we cannot name these poisons nor are we certain of the offending organisms. Pyorrhoea alveolaris is a common cause of alimentary toxaemia, and the patient is commonly much surprised when the damage it does is pointed out. Farther on in the gastro-intestinal tract the difficulties in the consideration of the bacterial poisons are enormous. We have to consider many things: the influence of external temperature on the vitality of organisms; and the effect of one organism upon another—for example, the *Bacillus coli*, a normal inhabitant of the great bowel may have for its function the destruction of other organisms, such as the typhoid bacilli, while it may itself be the victim of other invaders. There is the well-known fact that the strain of an organism differs in different individuals, and the further fact that alteration in the culture medium may effect a change in the life of the organism. A case in point is the withdrawal of carbohydrates in carbohydrate dyspepsia, probably the simplest form of alimentary toxaemia, and one which Dr. Hale White recommends for more earnest study.

The nature and composition of the poisons in alimentary toxaemia is still unknown, but that is equally true of uraemia and diabetic coma. Dr. Vaughan Harley's contribution to the discussion, which dealt with the toxins of the alimentary canal from the chemical point of view (p. 555), shows the extreme complexity of the subject. Among other points he brought out was that the decomposition products were practically the same whether formed by the action of bacteria or by the enzymes in ordinary digestion, but he had to admit that hitherto pure toxin had not been isolated even from bacterial cultures. In adults in health the bacteria of the bowel produced indol as well as skatol, phenol, and cresol, and he believed that the continual absorption of these substances could produce true neurasthenia, while premature senile decay, with early arterio-sclerosis, was apt to accompany an increase of indol and urobilin in the stools.

Dr. Hale White has much to say of the twentieth century doctrine of intestinal stasis. He considers that the theory of mechanical obstruction as a cause of alimentary toxaemia is by no means proved; its advocates differ much as to what precisely the mechanical agent is, let it be enlarged Houston's valves, pericolitis, various developmental adhesions of the peritoneum, the formation of bands and abnormal mesenteries; indeed, the abnormal bands and the toxaemia, it is said, may be induced by the same cause. There is reason to fear that in trying to explain the symptoms of intestinal stasis we may "invoke the aid of alimentary toxaemia in the same reprehensibly loose way as gout, uric acid diathesis, and congestion of the liver have been called in to explain various vague symptoms we do not understand."

Dr. F. W. Andrewes, in discussing the bacteriology of the alimentary canal, considered the nature and properties of the bacteria and the part they play in

producing the poisoning. He appreciates Dr. Hale White's difficulty in defining the term. The words "toxin" and "toxaemia" convey certain notions to our minds, but they, after all, are only names for things we know very little about. He regards "alimentary toxaemia" as the "absorption from the alimentary canal of chemical poisons of known or unknown composition in sufficient amount to cause clinical symptoms, the blood having served as the channel of distribution." Now, it is difficult to specify the source of these chemical poisons. Bacteria are constantly undergoing disintegration in the intestinal tract, and there is possibility of harmful results from absorption of the endotoxins, but to what extent the toxaemia depends upon these we cannot tell. Probably it depends very little, so far as the normal flora are concerned. Dr. Andrewes lays down three propositions beyond which he cannot go, first, that poisoning is in some cases by foreign proteins, the liver being at fault; secondly, that the main effect of bacterial activity in the production of alimentary toxaemia lies in the ability to carry out protein cleavages beyond the capacity of the ordinary digestive ferments, and that this is attended by the formation of products which the body is unable to neutralize when in excess; and, lastly, that there is at present little evidence that true toxins derived from the ordinary flora play much part in the alimentary toxaemia.

Professor Saundby's contribution is worthy of diligent reading. It deals mostly with foods and food poisons. In regard to poisoning by faecal stasis his view is that "there is little evidence in favour of the popular notion that faecal retention favours the production in the bowel of putrefactive changes giving rise to poisons which are absorbed into the blood and cause various pathological changes." Without inflammatory changes the natural protection afforded by uninjured intestinal structures is sufficient. When toxaemia is present treatment should be based on the principles of eliminating the poisons already present, preventing their further introduction, and reinforcing the natural protective agencies; surgical intervention may become necessary when medical treatment, long continued, has failed and where there is distinct evidence of disease in the colon wall.

Mr. Arbuthnot Lane summarized his well-known views on the consequences of intestinal stasis and its surgical treatment. These are once again presented in forceful, emphatic style, and need no recapitulation here. Suffice it to say that a clear, definite, clinical picture is presented. Whether the author proves his contention that these patients readily develop tubercle or rheumatoid arthritis, or whether his belief will be generally accepted that these diseases cannot exist except in the presence of autointoxication, it remains for the future to decide. The great variety of symptoms and diseases which are swept into the net of intestinal stasis makes it necessary that many series of cases shall be published from all parts of the country and by many observers, with ample notes, photographs, statistics, and all the paraphernalia of a scientific investigation, before the theory announced and the practice adopted by Mr. Arbuthnot Lane can be presented as textbook surgery.

This discussion has already done something to light up the dark ways of the alimentary canal, and further light may be expected before it is concluded. The subject comes within the daily experience of every practitioner, and it is in just such a subject that the special opportunities of the general practitioner will prove really helpful.

MEMORIAL TO LORD LISTER.

AT a meeting held at the Examination Schools, Oxford, on March 8th, under the presidency of the Vice-Chancellor, it was resolved to form a representative committee from Oxford and the district to assist in raising the memorial proposed by the Royal Society to commemorate Lord Lister's services to humanity. Sir W. Watson Cheyne said that it was hoped to establish a real living monument in the form of a fund for the advancement of surgery. It was desired, in the first place, to establish some valuable prize for work done, not so much for the advancement of work in the early days of a man's life, but as a recognition of good work well completed—in fact, of the nature of the Nobel prize. Sir William Osler said that Lister's work had saved more lives directly than probably that of any individual man. The nineteenth century had witnessed four advances of the first importance—preventive medicine, initiated by Jenner, which had really been one of the great glories of British medicine; the discovery and confirmation of the germ theory of disease, initiated by Pasteur and carried on by Koch; anaesthesia, which humanity owed to America; and, finally, the great system of treatment devised by Lister. This last work was remarkable for three things—its universality, its life-saving and health-giving features, and the enormous saving of pain which had been effected through it.

TREATMENT OF AMOEBIC DYSENTERY AND HEPATIC ABSCESS.

AT the meeting of the Académie de Médecine on February 25th, M. Chauffard, Professor of Clinical Medicine in the University of Paris, related a remarkable case of hepatic abscess opening into the bronchi, which, after lasting five months, was cured in five days by the hypodermic injection of emetine in the manner described by Professor Leonard Rogers of Calcutta in our pages on June 22nd, August 24th, and September 28th (p. 828), 1912. Professor Chauffard's patient suffered from irregular fever, and was expectorating daily on an average nearly a pint of the characteristic crushed strawberry material. On the second day of the treatment the temperature fell to normal and the amount of expectoration was much reduced. On the fifth day it ceased, the leucocytosis had greatly diminished, and the patient began rapidly to gain in weight. The physical signs in the thorax disappeared, and ulceration of the rectum, which had been seen before the treatment was begun, rapidly healed. The drug produced no unpleasant effects, and by the second day the patient declared himself distinctly better. Professor Chauffard is, of course, unable to say that no relapse will occur, but clearly he saw no reason to fear such an occurrence, and cited two cases recorded by Rogers in which, after death from accident not long after the treatment had been concluded, intestinal ulceration was found completely cicatrized. He pointed out the extremely interesting fact, from the purely scientific point of view, that the effect of emetine explained the good results obtained in some cases of dysentery by the administration of ipecacuanha, and absolved that traditional mode of treatment from the unexplained factor which made it rather unsatisfying to the medical mind. "It marks," he said, "one more stage on the road from empiricism to rational therapeutics." The almost instantaneous cure of a dysenteric abscess in which the amoebic process must have been active since the pus was haemorrhagic, can only be understood if we recognize "that the emetine directly attacked and killed the intrahepatic amoebae, and that the method thus attained the *therapia sterilans*, the ideal too seldom reached, of anti-infectious therapeutics. We have here, then, a notable fact in the history of dysenteries and of amoebic abscess of the liver." He went on to point out that as the two chief types of dysentery differ in their pathogeny, so their duality is shown also in the field of therapeutics;

each is curable by a different specific treatment, the bacillary dysenteries by sero-therapy, the amoebic by emetine. The facts, he says, compel the conclusion that in this instance we have to do with a specific amoebotropism, "comparable to the most specific tropisms known, such as the action of quinine in malaria or of salvarsan or mercury in syphilis." And then in a few sentences of real eloquence which won the applause of the Academy, Professor Chauffard said that he could not but hope that the method would prove to be one more magnificent victory for therapeutics. "What benefits will not Rogers's method bring with it if it renders it possible to cure amoebic dysentery, and to prevent or arrest amoebic abscesses of the liver which are so often fatal? How many human lives would be saved, and we, conquerors of Morocco, colonisers of Madagascar, of Indo-China, and of West and Equatorial Africa, what a debt of gratitude we should owe for so priceless a discovery!" The debt of Britain would be even greater.

THE CARE OF THE DEFECTIVE IN AMERICA.

MISS WINIFRED MUIRHEAD, L.R.C.P.Edin., Pathologist at the Royal Edinburgh Asylum, has given (in the January issue of the *Journal of Mental Science*) an interesting and instructive account of a recent visit to institutions for the care of the defective in three of the American States—namely, Massachusetts, Pennsylvania, and New Jersey. In Massachusetts the laws for the control and care of the defective of all classes are administered by the State Board of Insanity, much as is contemplated will be the case with the "Board of Control" in this country if the Mental Deficiency Bill becomes law in the form in which it left the Committee stage last session. Miss Muirhead points out the advantage of unity of control by one central body and the facilities resulting for the transference of patients from one type of institution to another as may prove desirable. She then describes in some detail the admirable organization, under the direction of Dr. Fernald, of the associated School for the Feeble-minded at Waverly and its large farm colony at Templeton, accommodating an aggregate of 1,500 patients; 250 adult males are employed on the farm, which extends to about 2,000 acres, and is distant 61 miles from the parent institution. Both establishments consist of "scattered" cottage units; those at the school each accommodate about 100, and at the farm from 50 to 60. The structural cost works out at about £75 a bed for the school and £40 for the farm, the maintenance, etc., at 15s. 6d. a head. All the farm produce is consumed by the inmates of the two establishments, and bread, clothing, etc., made by Waverly labour, are supplied to the farm. Miss Muirhead was impressed with the practical character of the instruction given even to young and low-grade children at Waverly, where time is not wasted by trying to impart mere scholastic knowledge to those found incapable of such attainments, but manual occupations are early entered upon so as to train for industrial usefulness in after-life. It is found that a large percentage of the boys who show no aptitude for school subjects become good workers at the farm, where only 25 per cent. have successfully gone through scholastic education. It will be remembered that our Royal Commission reported in highly commendatory terms of Dr. Fernald's labours, and it is to be hoped that his establishment will form a model for the new institutions which will arise in this country. Visits to the State institutions for feeble-minded at Elwyn (Penn.) and Vineland (New Jersey) are also recorded, and it is remarked that in these States the absence of power of permanent detention of adult cases is a drawback to the complete success of the work. The subject of sterilization is referred to somewhat doubtfully in the absence of a sufficient body of reliable statistics. The Monson State Hospital for Epileptics (Massachusetts) is briefly described, and seems to afford admirable accommodation for this class in groups of cottage homes extending over an estate of 1,000 acres. Miss Muirhead concludes that "the small Commonwealth of Massachusetts has progressed further than we have in the care and segregation of the defective, and that it is alert to the necessity of progressing still further . . . in order to combat the evils . . . which sap the vitality of the race."

CONFECTIONER'S PARONYCHIA.

CONFECTIONER'S paronychia, which is fairly common in preserved fruit factories in the South of France, is not, in the opinion of Strauss,[1] confined to workers in sugar, for, of three patients recently examined by him, one was a cook, another was a scullerymaid, and the third, who was a confectioner, had very little to do with the preparation of fruit. The disease ranges from simple chronic inflammation of the borders of the nails to purulent inflammation of the nail-bed. Its two most characteristic features are a chronic course and relative painlessness. A certain amount of itching and burning may be experienced, but they are seldom severe enough to send the patient early to a doctor. Several fingers are usually involved, either simultaneously or consecutively. An early feature is the presence of small erosions at the borders of the nails; here corrosives, sugar and fermenting dirt accumulate, and the mischief extends thence to the surrounding structures, causing redness and swelling around the nail. Gradually the nails are loosened piecemeal from their lateral attachments, and become dull, brittle, and black. In spite of these changes, the patient frequently continues his work till small indolent, subungual abscesses form, and granulations grow from the borders of the nails near the matrix. The exudation of serous or sero-purulent fluid from these granulations finally forces the patient to seek medical aid. When spontaneous recovery occurs, the gradual detachment of the nail is followed by the fusion of the underlying granulations into a single hump, which gives a club shape to the terminal phalanx. But spontaneous recovery does not readily occur, and, left to itself, the disease tends to become chronic, lasting for several years with remissions. The conditions apt to be confused with confectioner's paronychia include ordinary infectious paronychia, or whitlow, and eczema of the nail. The former is distinguished by its acute and painful character, and by the rapid formation of pus. The nail also falls off in one piece, and no granulations are formed. In the latter the edge of the nail is indented, its substance is stratified, vesicles appear in the matrix, and there is excessive secretion. When psoriasis attacks the nail the periungual tissues are unaffected, while the nail itself becomes thickened and elevated above the surrounding structures. Syphilitic disease of the nail, on the other hand, chiefly affects the periungual tissues, which become red and swollen, while the nail itself becomes dull and brittle. Other manifestations of syphilis, such as paronychia of the toes, should prevent a mistaken diagnosis. In scrofulous paronychia, which may easily be taken for confectioner's disease, several nails are involved, the bed of the nail is livid, the skin swells around the nail, and there is a brownish-red secretion. Characteristic features of this condition are its painfulness, its occurrence in children and young adults, its chronic course, and the failure of the nail to regain its former healthy condition. Great caution should be shown in making the prognosis in confectioner's paronychia. Scrupulous cleanliness is the best treatment. When the disease is treated early, cure may result if the employment is given up for a few months. A healthy condition may then be maintained by frequent washing with soap and warm water, followed by rubbing in glycerine and careful drying. Strauss is not in favour of the antiseptic solutions and ointments commonly

[1] *Deut. med. Woch.*, 1912.

recommended. In the advanced stages of the disease a clean sweep of all the structures involved is necessary if a relapse is to be avoided. When the old nail and the surrounding structures have been removed the new nail is at first thickened and brittle.

A CUTANEOUS DYSTROPHY.

THREE cases of family dystrophy of the hair and nails have been reported recently by Eisenstaedt.[1] The condition was observed in three brothers—the third, fifth, and ninth children in a family of nine, eight of whom are living and in good health, while one child, a girl, unaffected, died in infancy. The family thus consisted of six boys and three girls, the affected subjects being all males. The father, a German, is unaffected, and there is no history of the anomaly in his ancestry. The mother, who is dead, was of French-Canadian extraction; she exhibited the condition, and it has been traced in her family through five generations (inclusive of the three children). The relation of the affected ancestors to the children are great-great-grandmother, great-grandmother, grandfather, mother. The author remarks that White's case[2] was also of French-Canadian extraction. The principal points in the description are: The hairs grow very slowly and there seems to be some anomaly in their implantation, but nothing abnormal in structure was revealed by microscopic examination. The eyebrows are very poorly developed. The hands are normal in contour, save for the distal phalanges, which are noticeably increased in volume. The skin on the distal phalanges shows a moderate increase in thickness. The nails on the hands are all affected to about the same degree, and show an enormous hypertrophy of the nail-bed. The nails are kept short because, if allowed to grow beyond a certain length, they become brittle and crack at the very slightest trauma. The nails of all toes of both feet are affected in a similar manner but to a less degree. There is absolutely no sign of hereditary syphilis in any of the children. No paronychiae were found, and the ages of the children (14, 9, 1) did not allow of any definite conclusion as to their grade of intelligence, although the eldest boy seemed normal for his age. The author refers to the possible relationship between this abnormality and acanthosis nigricans, a condition which is characterized by dystrophic changes in the dermal appendages; one of these children exhibited papillary hypertrophy similar to that noticed in acanthosis nigricans. Another suggestive fact is that the mother, who was also affected, died of some malignant abdominal growth. Nicolle and Hallipré state that the thyroid was absent in their case; Eisenstaedt states that the thyroid was present in the oldest of his three cases, but in the second its existence could not be determined.

ACTIVE AND PASSIVE HYPERSENSITIVENESS TO TUBERCLE BACILLI.

A GREAT number of very competent observers have occupied themselves of late years in the attempt to elucidate the problems of the varying degrees of sensitiveness to the attacks of the tubercle bacillus, as shown by experiment on animals, and incidentally to prove their relation to the tuberculin reaction in man. Results have hitherto been somewhat inconclusive, and a further series of observations carried out by Drs. Thiele and Embleton in the Bacteriological Laboratory, University College, has recently been published.[3] Beginning with the production of hypersensitiveness in the guinea-pig by the inoculation of a sterilized emulsion of tubercle bacilli and afterwards by the introduction of isogenous and heterogenous tissues they have tested their animals in every case for the anaphylactic shock, the temperature reaction, and for any cutaneous changes that might be expected to occur, on further inoculation with active B.E. These changes, as regards general symptoms and pathological appearances, were sufficiently uniform to permit of a typical standard being set up. The temperature variations, although following a more or less constant course, were sometimes irregular. The inoculations of B.E. were made systematically into a vein or into the peritoneum or upon the skin. The results in the latter case appear to have been for the most part negative. The symptoms exhibited on inoculation after sensitization were convulsions, cyanosis, respiratory spasm, loss of corneal reflex, and rapid death. The principal *post-mortem* findings were marked emphysema and expansion of lungs, slow coagulation of the blood, and long-continued pulsation of the heart. These experiments are held to prove that hypersensitiveness to tubercle can be produced in the guinea-pig by injection of finely divided bacilli or by the inoculation of blood from an acutely hypersensitive guinea-pig or highly sensitive human patient. Tuberculous tissues when inoculated produced similar symptoms, but many such tissues contained antibodies as well as bacilli. It is further claimed that the reacting antibody which calls forth fever, etc., with tuberculin in the tuberculous patient, is identical with that which causes anaphylaxis and temperature changes in guinea-pigs which have been rendered hypersensitive. Hypersensitiveness to tubercle in the human subject has been generally regarded, when produced artificially, as being due to the use of too large a dose, but it has been assumed that the injection of tuberculin is powerless to produce sensitiveness in animals. The observations referred to above would seem to show that this assumption is not fully justified.

[1] *Journal of American Medical Association*, 1913, lx, p. 27.
[2] C. J. White, *Journ. Cutaneous Diseases*, 1896, p. 220.
[3] *Zeitschrift f Immunitatsforschung und Exp. Ther.*

THE ETHICAL BEARING OF HEREDITY.

ONE of the most serious difficulties in the scientific interpretation of Nature is the reconciliation of a view which seems to bind all facts together by a chain of mere mechanical necessity with any rational theory of human freedom and responsibility. Many worthy persons are deterred from yielding allegiance to the findings of science because it seems to them that by so doing they would be committing themselves to a fatalist philosophy. In a presidential address delivered to the American Society of Naturalists[1] Professor E. G. Conklin has dealt with one important aspect of this problem in a reassuring manner and with a lucidity deserving high praise. He points out that while it is true that our main characteristics, mental, moral and physical, are unalterably fixed by heredity, it does not follow that all the possibilities of good or evil that may be latent in a given personality are bound to develop, or that education and other environmental influences are of no avail. It is our possible, not our actual personalities that are predetermined in the germ cells; as to which of these possibilities shall and which shall not be realized, much must depend upon the circumstances under which growth and development proceed. Growth being a function of the interaction of intrinsic and extrinsic activities, there can be no predetermination of the organism unless that of the environment is also assumed. Faculties of a desirable kind may be strengthened by use until their due response to the familiar stimulus has become a habit; conversely, by denial of the opportunity of response, undesirable tendencies may be starved and eradicated. Professor Conklin defines responsibility as the power on the part of the individual of responding to rational, social, and ethical stimuli or impulses, and of inhibiting stimuli of an opposite nature; and the corresponding expectation on the part of others that the

[1] Heredity and Responsibility, by Professor Edwin G. Conklin, *Science*, January 10th, 1913.

individual will so respond. This implies on the part of society a duty of safeguarding those who, from immaturity or other causes, may be incapable of choosing their own environment against extrinsic stimuli of a dangerous or otherwise unfavourable kind. It implies, further, the positive obligation of providing such environmental influences as are calculated to develop the best possibilities of a given inheritance. Professor Conklin quotes Darwin and William James in support of his own belief that most men possess reserve powers which they never exercise, and that individuals differ far more in zeal and determination than in actual capacity. The most urgent problem is, he considers, not so much the improvement of human inheritance as the fuller utilization of existing talents. He therefore deprecates the undue coddling prevalent in the homes of the rich and in many schools and colleges, pointing out the power of hard necessity "to rouse the sleeping giant within us" as evidence of the preferability of a more virile method of training. Professor Conklin disclaims any intention to depreciate the possibilities of eugenics as a means of improving the race, but considers that in the present state of knowledge we cannot safely do more than attempt to prevent the reproduction of the obviously unfit. "Could any one," he asks, "have predicted Abraham Lincoln from a study of his ancestry?" He adduces the fact that national emergencies are wont to lead to the discovery of great men whose powers appear to be specially appropriate to the needs of their time, in favour of his belief that the potentiality of greatness is far commoner than is generally supposed, but in the majority of cases is not fully evoked. Leaving, therefore, the as yet insoluble question whether all the phenomena of life and mind can be explained on a mechanistic basis, he reminds us of the energizing effect of a belief in our freedom and responsibility, and of the debilitating results of the contrary conviction that since all is predetermined our aspirations and efforts are of no avail.

TRAUMA IN THE PRODUCTION OF MAMMARY CANCER.

IN those delightfully colloquial lectures which Dr. John B. Murphy of Chicago addresses directly to those who attend his cliniques, or indirectly through the volumes of his *Surgical Clinics* to a wider audience of practitioners, he compresses in short compass much shrewd and pithy information that is applicable not only to the particular cases under discussion, but also serves in place of more abstract papers on the subjects in general. His clinical methods of teaching are models of what clinical lectures ought to be. In the latest bi-monthly number (December, 1912), for example, he discusses an ordinary cancer of the breast, prefacing his operation by remarks on the general pathology, and accompanying it by explanatory remarks on the *rationale* of each step. There is much for agreement and not a little for disagreement in what he says. He considers that the relation of trauma to carcinoma of the breast is peculiar. He adheres to the belief that carcinoma in other situations is the sequence of repeated mild irritations, whereas sarcoma follows one moderately severe irritation or trauma, never a superlative trauma. Thus, carcinoma of the lip does not result from a severe blow to it, but occurs on account of a continuous mild irritation from a tooth. Sarcoma never occurs in a bone as a result of an injury severe enough to fracture the bone, but follows a trauma severe enough to cause pain. The case of the breast, on the other hand, is exceptional, for one single trauma of moderate severity produces a carcinoma after the lapse of six to thirty months. Few surgeons would be prepared to accept such wide generalizations; and though Leaf in this country obtained in 32 per cent. of cases a definite history of injury to the breast affected, yet the probability is that, since the mammae are so very liable to accidental blows in the ordinary course of events, female patients, noticing a lump in the glands, are apt to cast back their minds to some particular trauma that otherwise would have been forgotten. Murphy, too, performs a rather conservative operation on mammary cancer. He contents himself with removing the fascia over the pectoralis major, leaving the muscles intact, as a rule, basing his procedure on the original report of Bryant, who had seen only one case of recurrent carcinoma in the pectoral muscles in an experience extending over forty years. Many a pathologist who had experience of *post-mortem* examinations of cases dying from recurrent breast cancer when such operative procedure was usual would not be prepared to agree with this, nor with the statement that the sites of metastases are the femur, the bodies of the vertebrae, the liver, and the brain in order of frequency. If operative measures were based on Bryant's statement, the rather gloomy outlook to which Murphy candidly confesses might be more justifiable. The whole lecture teems with points forcibly and arrestingly put by the author, and productive, it may be, of thought and criticism in others, but certainly far from mere sterile platitudes.

SPORT, FAME AND UTILITY.

WHY is the sportsman of distinction, so popular a figure among his contemporaries, forgotten so soon after death has removed him from the scene of his triumphs? This question has recently been raised by Dr. T. Claye Shaw, and in the same article[1] he submits various answers, none of which, we think, he himself would be prepared to guarantee as adequate. He points out the affinity which, although seldom recognized, undoubtedly exists between sport on the one hand and on the other those ideal avocations—aesthetic, literary or scientific—whose pursuit is largely its own reward. He claims on behalf of the genuine sportsman that the qualities—physical, mental and moral—which confer eminence in his own vocation are worthy of a degree of commemoration which in fact they seldom attain. The explanation Dr. Shaw favours most is that the speedy oblivion which befalls the sportsman is due to the fact that his aims are purely personal and even selfish: "he is of no use to the race." We do not question that there is much truth in this explanation; on the other hand, it is impossible to admit that utility, in the commonly accepted meaning of the term, is the principle upon which permanent fame is allotted. It would, for example, be difficult, we think, to demonstrate the utility in any material sense of a picture by Raphael, a nocturne by Chopin, or a sonnet by Keats. We may and most of us do feel that the world would be a poorer place without such things, but to call them useful and to allege that their creators are immortal on that account are assertions which at once succeed and fall short of the truth. In science, as in art, the criterion of mere utility fails; the highest awards of honour fall to those whose achievements are upon the super-utilitarian plane. The demonstration by Semmelweis of the cause and mode of preventing puerperal fever resulted in an enormous and immediate saving of life. It is true that Semmelweis is commemorated by a monument at Budapest, but is he famous in the sense or degree that Galileo, Newton, Harvey, and Darwin are famous? The note of those kinds of greatness which achieve true fame is, we suggest, not utility, but universality of import; and since the exploits of the sportsman result almost exclusively in the demonstration of his personal prowess, interest in them is naturally confined in the main to those who actually witness or hope to surpass them. Yet, since the maintenance of a high standard of virility is a matter of racial interest, we agree that there

[1] Some Facts in the Psychology of Sport. By Dr. T. Claye Shaw *Baily's Magazine*, February, 1913.

is much to be said for Dr. Shaw's claim on behalf of the notable huntsman or cricketer to at least a memorial tablet.

MODERN MEDICINE AND THE LAYMAN.

IT has often been said that at the age of 40 we are all of us either fools or physicians. This somewhat sententious judgement presses a little hard on the layman, who has often, for one good cause or another, had little opportunity of acquiring medical knowledge during the first two score years of his life. The daily press, of course, has done what it can for several years to make up for the possible medical deficiencies of the layman, giving him frequent doses of diluted medical knowledge in forms that may be supposed to suit his untrained powers of scientific assimilation. Experience shows, however, that such snippets of medicine as may be picked up in this way do little more than illustrate the dangers of a little knowledge. The lay reader is apt to accept them as gospel truth, to distort them by prolonged rumination, to reproduce them entirely *mal à propos* when consulting his medical attendant. Dr. F. S. Lee, of Columbia University in the City of New York, has made a very successful effort to remedy this state of affairs by writing a compact book,[1] in which he gives the layman a well-written and fairly comprehensive guide to the aims and attainments of the scientific medicine of to-day. The volume represents eight lectures delivered in the author's university. In these lectures Dr. Lee gave a popular account of the structure and working of the human body, followed by a description of disease, its causes and treatment. The problem of cancer was discussed, and at the end the aims of modern surgery and of modern experimental medicine were outlined. Quackery is a weed of even more vigorous growth in America than in England, and it is to books such as Dr. Lee's that one must look for the most rational check to its growth. Dr. Lee writes with clearness and moderation; he is a pragmatist and an empiric so far as the philosophy of medicine is concerned; and there is little or nothing in his pages that should not be intelligible and interesting to laymen of average education.

MEDICAL EDUCATION IN CHINA.

AT the triennial Conference of the China Medical Missionary Association, which took place at Peking in January, the subject of medical education in China was, as has already been stated, the principal matter for discussion. For some time past the association has been engaged in an endeavour to co-ordinate the medical training which has been carried on for many years in different mission hospitals in China. It is now felt that the time has come when no training school should profess to send forth qualified practitioners unless it is able to attain a certain standard of efficiency. Certain resolutions have been passed arranging for a curriculum modelled on the British plan, and with a somewhat similar standard of educational efficiency for those entering a medical school. The most important point, however, is in the matter of the staff, and the association has formulated the principle that no school should be regarded as efficient which has not a staff of at least ten qualified teachers, European or Chinese, with some means of providing for furlough vacancies. The association strongly recommends the use of Chinese as the medium for teaching, though it recognizes that students should know at least one foreign language, which would give access to suitable medical literature. Whether this should be English or German may, perhaps, be determined by the Chinese education authorities, and it is thought that the German language may be selected by them. This might prove a serious difficulty for the medical schools contemplated by the association, and it is greatly to be hoped that English will at least be allowed as an alternative language. The centres selected by the China Medical Missionary Association as most suitable for medical schools under mission auspices are Moukden, Peking, Chinanfu, Nanking-Hanchow, Hankow, Chengtu, Canton, and Foo-chow. It is understood in each case that the school would be a union school, in which representatives of different missionary societies would combine at each centre to provide a proper staff and equipment, and it is felt that only in this way can adequate teaching be provided. It is not yet at all certain that all of these schools can be efficiently maintained, and there is the possibility of some of them becoming schools for the training of medical workers of a class similar to the hospital assistants in India. But, in any case, it should be understood that several of these schools are only in process of formation, and that the programme set out by the China Medical Missionary Association may require modification.

[1] *Scientific Features of Modern Medicine.* By F. S. Lee. New York: Columbia University Press. 1911. (Demy 8vo, pp. 192. 6s. 6d. net.)

THE Oliver Sharpey Lectures, to be delivered by Professor A. D. Waller, F.R.S., before the Royal College of Physicians of London on April 8th and 10th, will deal with the electrical action of the human heart.

Medical Notes in Parliament.

The King's Speech, delivered at the opening of Parliament on March 10th, contained the following paragraph: "You will be invited to give renewed consideration to proposals for the better care and control of the feeble-minded and for the further restriction of the industrial employment of children." The speech also stated that proposals would be submitted for the development of a national system of education. Lord Crewe afterwards said that it was not the intention of the Government to force through Parliament this session a vast measure dealing with national education, but only to place the country in possession during the coming session of the general lines of the intentions of the Government. One object would be to ensure that the education given in the primary and secondary schools and colleges respectively merged the one into the other. Attention would also have to be given to the physical needs of the children. No mention was made in the speech of legislation with regard to National Insurance, but it will of course be necessary to introduce a bill to authorize the allocation of the sum of £1,825,000 to carry out the promises of the Chancellor of the Exchequer made at the conference of the Advisory Committee held on October 23rd. It seems probable also that an amending Act may be introduced to deal with various matters, among others with casual labour and the aged members of friendly societies. Further, if, as seems probable, the Committee which has recently been taking evidence in Ireland recommends the extension of medical benefit to that island, an amending bill or clauses in such a bill will be necessary. The Government appears also to be under an obligation to give legislative effect to the recommendations made by Sir John Dewar's Committee on Medical Aid in the Highlands and Islands, a matter which is regarded as urgent by all acquainted with existing conditions.

Scottish Universities and the Treasury Grant.—Mr. Masterman, in replying to a question by Sir Henry Craik, on March 6th, said he could make no statement at present on the subject, except that he was in communication with the university authorities; he had not yet received their answer.

Milk and Dairies Bill.—Mr. Asquith informed Mr. Bathurst, on March 12th, that the Government hoped it might be possible to carry this bill this session.

Tuberculosis Prevention (Ireland) Act, 1913.—This measure has received the Royal assent.

England and Wales.

[FROM OUR SPECIAL CORRESPONDENTS.]

LONDON.

THE MEDICAL SOCIETY OF LONDON.

THE ancient, but still extremely active, Medical Society of London must not, as Dr. Leonard Guthrie said, be judged by years, for in spite of its 140 winters no trace of senility or decay can be traced in its works. Ample testimony to the success of the society, both from the scientific and the social aspect, was borne by the speakers at the anniversary dinner, which was held at the Hotel Metropole on March 5th. Sir Watson Cheyne, Bart., the President of the society, occupied the chair, and over 100 members and their friends were present.

Sir Francis Champneys, President of the Royal Society of Medicine, proposed the toast of the Medical Society. Though it had refused to be swallowed up in his own society, a feeling of cordial friendship, he said, existed between the two societies. Sir Watson Cheyne, in reply, discussed in some detail the beginnings of the Royal Society of Medicine and its mother society, the Royal Medical and Chirurgical Society, and observed that during the past year the majority of the communications made to the Medical Society were on surgical subjects.

Mr. C. J. Symonds, in proposing the health of the guests and the kindred societies, spoke highly of the excellence of the Army Medical School. Sir Rickman Godlee, in his reply, delighted his audience with a bright sketch of the Quaker beginnings of the Medical Society. Dr. Leonard Guthrie replied for the other societies. Dr. Macnaughton Jones proposed the toast of the "President," who concluded a brief reply by proposing the health of the secretaries, Mr. Corner and Dr. Young, and the registrar, Mr. Bethell, all three of whom responded.

PROPOSED REGULATION OF FRIED FISH VENDORS.

The Public Health Committee of the London County Council on March 13th submitted to the Council for approval a series of by-laws for regulating the conduct of the businesses of fried fish vendor, fish curer, and rag and bone merchant. After the proposed regulations have been considered by the metropolitan borough councils, the Local Government Board will be asked to confirm them. The by-laws with regard to a vendor of fried fish are intended to ensure precautions to prevent effluvium arising from the operation of preparing the fish, and that garbage, etc., shall be speedily removed.

Scotland.

[FROM OUR SPECIAL CORRESPONDENTS.]

LIVINGSTONE CENTENARY CELEBRATION IN EDINBURGH.

TO-MORROW, Sunday, March 16th, is to be observed as Livingstone Sunday in the churches. On Monday the Lord Provost and Council hold a civic reception in the Royal Scottish Museum (where also a special Livingstone exhibition will shortly be opened); and on Wednesday, the 19th, which is the actual birthday of David Livingstone, a memorial service will be held in St. Giles's Cathedral at noon, and a public demonstration in the evening in the Synod Hall. There will also be meetings on March 20th and various children's demonstrations.

THE LIVINGSTONE MEMORIAL DISPENSARY.

One of the most interesting parts of the premises occupied by the Livingstone Memorial Dispensary at 39, Cowgate, is the Chapel of St. Mary Magdalene. Since the dispensary was built in 1874 in memory of David Livingstone, the chapel has been used by the Edinburgh Medical Missionary Society in connexion with its work of training students for the foreign field; this is with the permission of the Protestant Institute of Scotland whose property the chapel is. This building was visited on Saturday, March 8th, by the Scottish Ecclesiological Society, whose members were much interested in the fact that it contains the only ancient (pre-Reformation) stained glass in Scotland of a coherent design and still in its original position. In this chapel the General Assembly of the Church of Scotland met in 1578, and it was here also, a little more than a hundred years later (1685), that the body of the Earl of Argyle was temporarily placed after his execution. In a few days services in commemoration of the Livingstone Centenary will be held here, and every week crowds of patients gather within the walls of this interesting bit of old Edinburgh, which was originally founded by one Michael Macquheen, "being greatly affected by a grievous distemper and oppressed with age."

LAURISTON PLACE HOME FOR MATERNITY RESCUE WORK.

This home for maternity rescue work plays a useful part in the prevention of abnormal labours and the diseases of pregnancy, as well as serving as a means of rescuing young girls illegitimately pregnant for the first time. The young expectant mothers are under medical supervision whilst in the home, and thus deviations from the normal healthy state of pregnancy can be at once detected and often cured; in more serious cases the woman can be transferred to the prematernity ward in the Royal Maternity Hospital, which is situated within a stone's throw on the opposite side of the street. If all goes well the patient enters the hospital when labour pains come on. At the annual meeting of subscribers, held on March 6th, it was reported that in 1912 seventy-one unmarried girls about to become mothers had passed through the home. Some of them were no more than children; one was 13 years old, and there were three of 15, two of 16, and three of 17 years.

THE CHILDREN IN THE STREETS.

Dr. John Thomson, in a touching letter to the *Scotsman* newspaper for March 4th, makes a strong appeal for the Play Centres Society, whose object is to draw poor children off the streets and out of the gutters where they spend their play time in winter and gather them into warm rooms, where they can play at games or practise scrap-painting, wood-carving, etc., under kindly supervision. There are at present six play centres in operation, but there should be many more. The value of such means in the prevention of children's maladies, and it may be of lifelong bad health, is obvious.

NEW PHTHISIS BUILDINGS AT THE EDINBURGH CITY HOSPITAL.

In the Colinton Mains Hospital it has been customary for some years past to accommodate advanced cases of phthisis; but, in order to meet requirements consequent upon the arrangement made between the Town Council and the Insurance Committee of Edinburgh for dealing with this class of patient, new buildings must now be provided, and the Town Council has approved plans for new buildings forming an instalment of a scheme to provide ultimately 112 beds; 63 beds (36 for females and 27 for males) will be at once provided, and already a number of revolving shelters, each containing 2 beds, have been erected. The new buildings, placed about 300 yards apart, are situated to the south of the permanent hospital buildings. The permanent administrative buildings will be utilized in connexion with the new ward. The new buildings will be of timber secured to a concrete foundation. A combined dining and recreation room forms the centre of the south-west range, while nurses' rooms are placed at the angles. Sanitary annexes, with dressing rooms, will be provided at the north end of each set of shelters, and along the south side of the buildings verandahs will be erected. The city architect, Mr. Williamson, in collaboration with the medical officer of health, Dr. Maxwell Williamson, has prepared the plans, and, though purposely devised to be constructed in the most economical manner, the building is regarded as likely to completely fulfil all the requirements necessary for the special object in view.

GLASGOW'S WATER SUPPLY.

The prospect of a still further extension of the Glasgow water supply is already being considered. The present aqueducts are capable of bringing 110 million gallons of water daily from Loch Katrine into the city. The average yield, on the basis of the three driest years since the

inauguration of the Loch Katrine scheme, is 75 million gallons a day. In addition, the old Gorbals Waterworks give a daily supply of 5 million gallons. Glasgow's present demand is about 66 million gallons daily, but the rate of consumption is increasing yearly by 10 million gallons a day, so that in about ten years the present sources of supply will be insufficient, and the extension of the catchment area will have to be considered. The Loch Arklet extension staved off for the time a bigger work, but in the not very distant future a new source will in all likelihood have to be added. Loch Vennacher is stated to be out of the question, and there are engineering difficulties in the way of the Strathyre watershed. Perth is credited with having designs on Loch Lubnaig, and Glasgow may have to tap the lochs on the Braes o' Balquhidder. The Loch Katrine undertaking, inaugurated fifty-two years ago, was considered a gigantic scheme, as indeed it was, and was then thought to be an inexhaustible source. Whether the Government scheme in connexion with the nation's water supply, indicated recently by Mr. John Burns, will have any bearing on this matter, or, indeed, will affect Scotland at all, remains to be seen. If, as thought probable, the Government deal with rivers, then Scotland will not benefit much, as rivers are not looked upon with favour in the North as sources for water supply.

BELLEFIELD SANATORIUM, LANARK.

The annual report submitted to the Glasgow and District Branch of the National Association for the Prevention of Consumption by the Medical Officer at Bellefield Sanatorium shows that for the year ending September last 165 cases were admitted and 151 dismissed. On the whole the results were satisfactory, but, as on a former occasion, the medical officer expressed regret that many patients on leaving the sanatorium returned to unhealthy environments and undesirable occupations.

The patients at Bellefield continued to engage in graduated labour with beneficial results. The work done included (heaviest class of labour) cutting down trees and putting in fencing, removing soil to sand pits, repairing cinder path, delving round in grazing field, assisting gardener and cutting grass; (intermediate) weeding croquet green, trimming walks, weeding about the grounds; and (lightest labour) cleaning brasses, picking up litter, and keeping the verandah platforms in order. There was no doubt about the benefit derived from regulated work in the open air, provided the cases were suitable. The temperature was taken as an indication in regulating graduated labour.

At the out-patient department in Glasgow there were 296 applicants for treatment during the year. The physician there reports that neither the notification of phthisis nor the greater interest now taken in the disease by the public has made any difference in the percentage of early cases. An analysis of the 157 cases selected as medically suitable for treatment at Bellefield showed that in 2 cases the diagnosis was doubtful; 10 cases were in the very earliest stage; 45 were early cases; 78 were in Class II, or intermediate cases; and 22 cases of advanced disease were selected, generally on account of their condition and physique being good in comparison with the extent of the disease in their lungs, and the probability that they had acquired a resistance to the disease. Most of these cases did very well, some making considerable improvement, but the risk of an active development of the disease at any time was much greater in this class of case than those in an earlier stage of the disease.

RECONSTRUCTION OF DUMFRIES INFIRMARY.

At the annual meeting of the governors of the Dumfries and Galloway Infirmary, it was stated that a sum of £7,000 was still required to complete the reconstruction scheme in connexion with the institution which was started a year ago. It was agreed that, if necessary, £5,000 should be drawn from the reserve funds to complete the scheme. It was reported that there was a deficit of £1,200 on the year's working of the institution. The chairman (the Rev. J. Montgomery Campbell) dealt with the position of voluntary hospitals under the Insurance Act, and stated that those institutions were now even more necessary than at any other time. The 10s. of aliment paid to insured persons did not provide for the treatment of cases requiring special nursing. He deprecated the idea of putting infirmaries under State control, and said that if ever that came about it would be a bad day for the sick poor. Mr. H. S. Gordon was appointed chairman of the directors for the ensuing year, and Sir Mark J. MacTaggart Stewart, Bart., was elected honorary vice-president.

NEW INFIRMARY AT PERTH.

The work of erecting the new infirmary has proceeded expeditiously, and the entire buildings, with the exception of the children's block, are now roofed in. It is expected that the main block will be completed by October next.

The directors have now been able to proceed with the erection of a children's ward on a larger scale than before, because of the sum of £1,187 11s. 10d. which had been handed over to them by the King Edward VII Memorial Fund Committee. To this has been added a donation of £750 from the trustees of the late Mr. Charles Anderson of Fettykil. Later, Mr. Peter Whyte, M.Inst.C.E., of Edinburgh, announced that he and his brother, Mr. William Whyte, desired to provide a sum of £1,500 for the erection of a second children's ward, to be dedicated to the memory of their father, the late Mr. John Whyte (Muirhead).

The total amount required to complete the entire building, on the assumption that a sum of £10,000 will be received for the old infirmary buildings, is £2,638 9s. 6d.

ABERDEEN DENTAL CLINIC.

The dental clinic scheme of the Aberdeen School Board was started on February 18th at the clinic rooms, 40, Union Terrace. There are three rooms, efficiently fitted up and furnished, and the dentists' equipment is specially adapted for children. The clinic is in charge of Dr. Campbell, a graduate of Aberdeen University and a dentist. He is assisted by a whole-time nurse, who was previously on the medical inspection staff of the board. Those who will receive treatment are necessitous children in their seventh year.

SCHOOL MEDICAL INSPECTION.

In the third annual report on the medical inspection of school children in the counties of Midlothian and Peebles it is stated that the number of children examined during the year amounted to 7,459. Of these, 2,310 were in their first year at school, 2,578 were in their last year, and 917 were specially presented by the teachers. Of children found defective at a previous examination, 1,654 were re-examined. The School Medical Officer, Dr. Robb, states that medical inspection has proved an incentive to parents to keep their children clean and tidy and to take other measures to maintain them in good health. "The amount of work involved in visiting schools and homes to make these re-examinations is increasing rapidly. It is one of the most important parts of school medical inspection, but it is at present carried out with difficulty, owing to the necessity for overtaking the routine work. It is evident, therefore, that further assistance will soon be required if the best results are to be obtained."

Ireland.

[FROM OUR SPECIAL CORRESPONDENTS.]

RESIGNATION OF MEDICAL STAFF OF NEWCASTLE SANATORIUM.

THE Board of the Royal Hospital for Consumption in Ireland held a meeting on March 6th to consider the resignation of the extern medical staff. In a long letter published in the daily press on March 8th the Board states that it had for some time felt that the management of the hospital might be open to criticism in two respects. First, the large increase in the number of beds, from 24 when the hospital was opened in 1896 to over 100 in 1910, forced the conviction that the visiting staff (two in number), although adequate for 24 patients in 1896, was inadequate for 100 patients. The second was that there was not sufficient employment of treatment except of the simplest character, that is, "open-air treatment." When the medical staff said that the medical treatment of the

patients was a question solely for the medical staff, the Board unanimously adopted the following resolution:

> Having read the letter from Dr. Crowe, informing the Board of the resolution unanimously adopted at the meeting of the Medical Committee on May 26th, 1911, the Board are of opinion that they cannot accept the position that the medical treatment adopted at the hospital is a matter solely for the medical staff, as they believe that they should from time to time inform themselves, as a Board, as to the system or systems of the treatment in use at the hospital.

The letter concludes with the gratuitous suggestion that the medical staff resigned their positions and made public their reasons, calculating, if not intending, to deter any other professional brother from giving his services to the institution, no matter what the effect might be upon the institution and however seriously the crippling of its usefulness might affect a suffering class of the community. "Happily," it is said, "the medical arrangements at the hospital preclude the possibility of such an unfortunate result." This is understood to refer to the two resident medical officers at the institution, who are not affected by the resignation or change of the extern staff, and to the appointment by the Board of a new visiting physician.

The real crux of the matter is that a lay board should claim to dictate to the medical staff on what is essentially a professional rather than an administrative matter. The question is considered of such importance that the Presidents of the Royal College of Physicians and Royal College of Surgeons have summoned a joint meeting of the colleges to consider the action of the Board of the hospital, and it is sincerely to be hoped that some reasonable adjustment of the difficulty may be reached, and that the Board will see the necessity of receding from an untenable position by which it is endangering the welfare of the institution for which it is responsible.

Special Correspondence.

BUDAPEST.

Post-Graduate Study in Hungary.—The New Building of the Workmen's Insurance Office.—One and a Half Hours on a Flywheel.—Town Sanatoriums.

THE Central Committee of Medical Post-Graduate Study held its annual meeting on Sunday, February 23rd. Post-graduate study has developed into a powerful organization from a very modest origin. In the past year the Budapest courses were attended by 147 doctors, and the provincial courses by 79, making a total of 226. Sixty-eight of these courses have enjoyed State support. The committee has distributed 6,000 kronen and the municipalities 8,500 kronen in aiding provincial doctors to attend these post-graduate studies. The Ministry of Public Instruction covers all the expenses involved by the administration and lecturers' fees. In the programme for 1913 certain new types of courses have been introduced. Besides the four weeks' courses, which served for more thorough study of a single subject, one-week courses will be held on syphilology, industrial diseases and accidents, and modern therapeutics. Professor Emile Grosz, the chairman of the committee, expressed hopes that this year the number attending would be doubled.

The new central building of the Workmen's Insurance Office, the most expensive building built here in recent years, cost 8½ million kronen (£350,000). It will occupy 10,873 square metres of ground, and will comprise not only a colossal building for the official department, but also extensive out-patient rooms, a large pavilion for experimental therapeutics, and an *x*-ray institute, all, however, for the exclusive use of insured members.

An overseer at a timber mill in Lagos, while recently going his rounds, attempted to replace the belt which had slipped off a flywheel 12 ft. in diameter. The wheel caught his coat-tails, lifted him off the ground, and revolved him for an hour and a half. Although there were several hundred workmen on duty, the accident was not known till the machinery stopped. The unfortunate man was then unconscious, and though terribly injured lived for three hours, regaining consciousness before his death, and declaring that he alone was responsible for his fatal accident.

The absence of sanatoriums for the middle classes has long been felt in Hungary. There have been for long public hospitals, maintained by the State or the municipalities, and private sanatoriums where high prices are charged, so that only the wealthiest people seek admission. The public hospitals have two or three wards for so-called "private paying patients," but the number of these wards is limited, eight being the maximum number, even when the hospital has 600 beds. Thus a majority of middle-class patients have the choice of entering wards among people of the lowest class or becoming bankrupt. The first middle-class sanatorium, equipped on the most modern lines but without superfluous luxury, will shortly be established by the authorities of the city of Budapest. It is estimated that the price for a room, medical attendance, foods, etc., included, will not be higher than 10 to 12 crowns (9s. to 10s.) a day. Medical expenses will be defrayed by the city. The new sanatorium will have accommodation for 150 to 180 patients. If this should prove a success, other sanatoriums will be established by other large municipalities.

Correspondence.

TRADES UNIONISM AND MEDICINE.

SIR,—Some members of the profession are very earnestly endeavouring to form the practitioners of this country into a trades union, believing that in this way a solid body may be established and a united front presented to any enemy that may seek to attack it. I venture to express a hope that before such a body be formed very serious consideration be given to the question of its disabilities and powers. The chief advantages which a trades union has over its members are these: The authority to issue orders for a general or partial strike; the "putting down" of tools; and the prevention by actual "peaceable picketing" (with its attendant use of force) of the entrance of "blacklegs" upon the scenes of the strike. Without these powers trades unionism would be a very feeble weapon and absolutely useless to effect the desired end. Can it be possibly contended for one moment that either of these powers could be used by educated professional men exercising the healing art and carrying on medical practice? Can the wildest imagination conceive an order emanating from the central office of the medical trades union ordering all members, irrespective of rank or position, to cease at a given time the care of and attendance upon patients suffering from all forms of disease and sickness? Can any sensible person imagine that such an order would or could be obeyed in any civilized country in the world? Or take the question of "peaceable picketing." Would such a thing be possible amongst medical men? The idea is monstrous; but without these foundations the whole superstructure of trades unionism falls to the ground at once. Union, of course, is strength; but trades unionism on its present lines can never be accepted by members of the medical profession, in my humble opinion. To effect the purpose of trades unionism it would be absolutely necessary to carry it out to its logical conclusion, and that we can never do. We cannot accept its "principles" without its "practice"; and I trust the day is far distant before we descend as doctors to the level of dockers. If our members cannot be united in a common bond of humanity, and keep their ethical and professional pledges without recourse to the basest principles of coercion by force, we must be content to be disunited. Any unity founded upon trades union lines would be degrading and derogatory to professional men in the extreme, and I hope that the suggestion will be scouted and dismissed as utterly untenable.

I am writing as a mere member of the profession, and not as an official of any organization.—I am, etc,

London, W.C., March 12th. A. GEORGE BATEMAN.

IMMEDIATE OPERATION IN APPENDICITIS.

SIR,—In his letter in the JOURNAL of February 22nd, Dr. Hunt pleasantly finds fault with me for wanting a *second* surgeon to confirm the diagnosis of appendicitis in the event of my becoming attacked with that disease. The reason for my suggesting another opinion was that, as there might possibly be some uncertainty in the making of a very early diagnosis (such as I would desire), some other friend might come in to help (for I should not try to be surgeon as well as patient), and in deciding in favour of an "immediate" operation, I think it right that always *two* medical men should be in agreement. Judging from the manner and purport of his letter, I would deem myself fortunate if the person so called in were Dr. Hunt.

I did not wish to draw too close a comparison between appendicitis and strangulated hernia, but I wanted to insist on the fact that "immediate" operation in the latter condition, instead of the use of "taxis" and hot baths (as in times not long past), had greatly reduced the mortality. And I pleaded for equal dispatch and improvement in appendicitis.

In the JOURNAL of March 1st letters appeared from a general practitioner from Scotland (Dr. Whitelaw), a Welsh surgeon (Mr. Lynn Thomas), and an English physician (Dr. William Ewart). The first-named deals with a matter of real importance in connexion with appendix operations, but he will not mind, I am sure, if I do not discuss it with him in these columns.

Mr. Thomas remarks that after twenty years' experience in operating upon appendicitis he is "not in the present—perhaps passing—fashion," and he writes:

> "I have not lost a single case where, in my judgement, it was necessary to try and get the patient out of his attack of appendicitis into a state of quiescence, or, to use a local phrase, which well expresses my meaning, 'drydock him for repairs.'"

He then goes on to say that appendicitis is a "surgical disease" for several hours, "but" that, later on, it

> "requires the greatest vigilance, the strictest observance of proper non-surgical treatment, to bring it into a state whereby the offending appendix can be removed with no risk except that of the anaesthetic."

(Surely those early hours were the very time in which the removal could be effected with the greatest safety.)

But he is silent about the early "surgical" cases which, in utter disregard of a distant prospect of "dry dock," spitefully hurry on to disaster. Yet all of them could have been at once rescued by an "immediate" operation. And as it is on this principle alone that one can be *sure* of saving them, its adoption must prove something better than a "passing fashion."

Let me suggest that Mr. Thomas is called early one morning in consultation on a boy who had been seized in the night with acute abdominal pains, that he finds a tenderness in the iliac fossa and rigid muscles over it, the temperature and pulse being at about a hundred. If he would urge immediate operation for this boy, I fail to see why he should claim to stand outside what he calls the "present—perhaps passing—fashion." But if he replies that he would leave him for "vigilance" and for the "strictest observance of proper non-surgical treatment," I say, and I say it with regret, that his teaching may have the effect of putting back the hands of the clock. It is only in the first twelve hours or so that the surgeon can claim to be master of the situation; he is unable to govern or guide the course of an inflammation of the appendix, and it is only by immediate operation that he can hope to do his share in the task of bringing down the alarmingly high death-rate in this disease.

If it so be that the surgeon is in suspense, Mr. Thomas declines to allow him to "look and see," "because," as he somewhat unhappily puts it, "it will inevitably lead to further carelessness."

In Dr. Ewart's broad-minded letter attention is called to the urgent need of making an early diagnosis so that operation may not be delayed. And, with this in view, he advises general practitioners and physicians "to watch for appendicitis always, and to examine for it as a clinical routine," just as they are accustomed to test all cases for a possibly latent renal trouble. Dr. Ewart's views upon "suspected appendicitis" I cordially accept, as, indeed, I do those of the whole of his letter.

I wish that I could fully agree with the statement of Mr. Musgrave Woodman, in the JOURNAL of March 8th, that "to diagnose appendicitis is easy." It is generally so; but the appendix has as its close neighbours the caecum, colon, ileum, ureter, and ovary, each of which is liable to its own troubles, and it is because of difficulty in making up one's mind in certain rare cases that, in the cause of safety, I would urge the surgeon to "Look and see." The truth of Mr. Woodman's remark that the risk of operating on an acute appendix is very slight, whilst that of sitting by and watching is full of danger, is becoming every day more apparent, and the expediency of immediate operation more fully recognized.

I think that I cannot do better than bring my reply to a close by a quotation from an excellent paper by Mr. Richardson, of Newcastle-on-Tyne, which appeared in the JOURNAL of September 28th of last year:

> "Most of the writing, both in textbooks and in periodicals, has reference to the treatment of the complications of appendicitis, rather than to appendicitis itself, so that, in the minds of many, these complications are regarded as though they were actual symptoms of the disease."

—I am, etc.,

London, W., March 10th. EDMUND OWEN.

SIR,—From the point of view of the public it is regrettable that there should be still any difference of opinion as to the advisability of immediate operation in acute appendicitis.

Without doubt a very large proportion of the deaths which occur every year is due directly to procrastination, and until public opinion be educated by the profession to regard immediate operation as the only safe method of treatment, this sacrifice of life will continue. In America the question has been settled long ago. To Americans, whether doctors or laymen, the position of those who advocate delay is incomprehensible. Last year a well-known American surgeon, on a visit to this country, expressed to me his surprise on reading the discussion which at that time was being carried on in the JOURNAL. "I do not understand," said he "why at the present day it is necessary to state the case for immediate operation." Further comment is needless.—I am, etc.,

London, W., March 10th. HERBERT J. PATERSON.

SIR,—In response to the suggestion of my friend, Mr. G. Grey Turner, of Newcastle, I have had all cases of appendicitis operated on in the years 1910, 1911, and 1912 in my practice analysed. Although a proportion of the cases has been done by my assistants, Mr. F. K. Smith (Royal Infirmary) and Mr. A. Mitchell (Sick Children's Hospital), yet one can state that the technique adopted by them is practically the same as my own. Including both private and institutional cases, there have been 697 operations done primarily for disease of the appendix during those three years. (This series does not include cases in which the appendix was removed in the course of operations primarily designed for other conditions.)

There were 106 acute cases "with limited infection" with no deaths, 32 of them being in children; 208 cases with more or less advanced infection of other parts (peritoneal and otherwise) with 25 deaths, or a mortality of 12.7 per cent.; interval and chronic cases, 383, with 1 death from sudden cardiac failure several days after operation. The mortality for all cases was therefore 3.7 per cent.

Of the 25 deaths in the acute series, 4 occurred out of 46 private patients—11 out of 61 cases in the Sick Children's Hospital, and 10 out of 101 in the Royal Infirmary. The adult mortality-rate in the advanced acute cases was 9.5 per cent., while that in children was 18 per cent.

These figures surely prove the advantage and necessity of operation at the earliest possible moment, *especially in children*.—I am, etc.,

Aberdeen, March 10th. H. M. W. GRAY.

THE AFTER-EFFECTS OF GASTRO-ENTEROSTOMY.

SIR,—The conclusions which Mr. A. W. Bourne draws, in the paper published in your issue of March 1st, from a series of cases of gastro-enterostomy are interesting and instructive to those who are familiar with the present position of gastric surgery, but are bound to convey an entirely erroneous impression to those members of the profession who are unable to interpret them at their true value.

To form any true estimate of the value of gastro-enterostomy for peptic ulcer of the stomach or duodenum one must take as a basis a series of cases in which one has details of:

1. The operative technique.
2. The character of the ulcer.
3. The exact position of the ulcer.

Mr. Bourne furnishes the most meagre information under all three heads. In a series of cases occurring in the practice of a number of different surgeons the operative technique will probably vary within wide limits, and of no operation can it be said with greater truth that an attention to technical details is of the utmost importance to the securing of a successful result. With the exception of the statement that in two cases an anterior gastro-enterostomy was performed, Mr. Bourne gives us no details as to the position or method of anastomosis or the presence or absence of a jejunal loop.

He tells us nothing as to the character of the ulcer; in four cases he states that no ulcer was visible, and one cannot help suspecting that in more than these four cases no demonstrable ulcer existed. It has been repeatedly pointed out that gastro-enterostomy is contraindicated in the young chlorotic woman with pain after food, vomiting, and occasional haematemesis, symptoms usually supposed to be due to gastric ulceration. In such cases the external coats of the stomach afford no evidence of the existence of an ulcer, and gastro-enterostomy is worse than useless. Unless the ulcer can be demonstrated both visually and by palpation, no surgical interference with the stomach is justifiable.

Gastro-enterostomy for symptoms alone is the acme of bad surgery, for a careful surgical differential diagnosis at the time of operation is as important as a medical differential diagnosis beforehand. To perform the operation for atonic dilatation, gastroptosis, chronic appendicitis, or tuberculous disease of the lower ileum is only to court disaster, and can do nothing but bring a most valuable operation into disrepute.

Finally we are given few details as to the position of the ulcer. From those Mr. Bourne supplies it is evident that the results were markedly better in duodenal ulcers and those gastric ulcers situated at or near the pylorus. Of the other cases classed as gastric we have no details; possibly they include some in which "no ulcer was found."

Surgeons with an extensive experience in gastric surgery are now in agreement that for ulcers situated on the lesser curvature at a distance from the pylorus, and those upon the posterior aspect of the stomach, the proper treatment is excision, either with or without gastro-enterostomy; gastro-enterostomy alone is productive of no relief. There is no doubt that the operation has been performed in a large number of unsuitable cases, and those who have been the pioneers in the field—Robson, Moynihan, and the Mayos—have been the first to point this out, and it is by a study of their writings and results that a true estimate of the indications for and results of operation in the different varieties of peptic ulcer can be formed.

My inquiries into the end results of Sir Berkeley Moynihan's cases of duodenal ulcer (*Duodenal Ulcer*, 1912 Appendix) show that in a series of 302 cases, extending over a period of eleven years, the mortality is 1.65 per cent., and the cases of complete cure calculated upon the whole number of patients, and not upon those who can be traced only, is 82.7 per cent. This series includes certain cases in which the operation should not have been done, and in the earlier cases the operative technique was imperfect; in the later cases the percentage of complete cures is over 90 per cent.

Similar results are published by W. J. Mayo (*Annals of Surgery*, September, 1911) in a series of 1,000 cases.

Duodenal and pyloric ulcers treated by gastro-enterostomy with infolding or excision of the ulcer, cured or greatly improved, 98 per cent.
Ulcers of body of stomach treated by excision with or without gastro-enterostomy, cured or greatly improved, 85 per cent.
Mortality well under 2 per cent.

Mr. Bourne's paper and the conclusions which he draws in it are calculated merely to obscure the issue, and to those who cannot read between the lines are positively misleading. It is not the operation itself which is to blame, but the employment of it in unsuitable cases. He appears to have entirely overlooked the main point; the success of operative treatment does not depend on the age or sex of the patient or the presence or absence of excessive free hydrochloric acid, but upon the presence and situation of a demonstrable ulcer.

The removal of the ovaries for abdominal pain has fortunately been relegated to the limbo of obsolete operations, and one had hoped that the performance of gastro-enterostomy for symptoms alone had followed the same fate, but apparently it is not so.

When surgeons realize that they must be prepared to reconsider their diagnosis when the abdomen is opened, we shall hear less criticism of the results of gastric surgery, and an operation which in the right cases is, perhaps, the most successful in the whole realm of surgery will be appreciated at its true value.—I am, etc.,

Leeds, March 10th. HAROLD COLLINSON.

SIR,—In a letter to the JOURNAL of March 8th, Mr H. M. W. Gray records the after-history of the 61 patients who survived the operation of gastro-enterostomy performed by him in 1909 and 1912 for non-malignant diseases. Because 95.5 per cent. of the series are at present entirely relieved he asks me to reconsider the adverse criticism of his theory of the anatomy and physiology of the stomach which I published in a letter to the *Lancet* two years ago. I am, however, unable to do so, as increased experience has only confirmed the views I then expressed. These were repeated at the annual meeting of the Association in Liverpool last year, in the opening address on the anatomy of the normal stomach, which I delivered before the combined Sections of Anatomy and Electro-Therapeutics and Radiology, and were received by anatomists, radiographers, and surgeons with practically unanimous agreement. If Mr. Gray will examine a series of normal individuals after a meal consisting of porridge containing 1 or 2 oz. of a bismuth salt or of barium sulphate, or, better still, of an ordinary breakfast with the same addition, I am sure that he, too, will be convinced that no such structure as a "middle sphincter" exists in the stomach.

Mr. Gray has certainly every reason to be pleased with the results of his operation, but I do not think that they are any better than those of most competent surgeons, including those who had operated upon the patients referred to in the paper on the after-effects of gastro-enterostomy, which was read by me before the Surgical Section of the Royal Society of Medicine, and was briefly reported in your issue of February 22nd. I did not suggest that the ill effects I described occurred in a large percentage of cases; my cases represented the somewhat considerable sum of a very small percentage of cases operated upon by many different surgeons. Two of Mr. Gray's incompletely successful cases are probably of the same nature, although the details are insufficient for a definite opinion, and I can quite imagine that the number of cases in which the particular conditions I described occur does not represent a larger proportion than 5 per cent. of all cases. My object in writing the paper was to show how some incompletely successful cases could be rendered completely successful—how, for example, the percentage of Mr. Gray's complete successes could, perhaps, be raised from 95.5 to 98.5.

Lastly, I do not think that Mr. Gray is justified in regarding cases operated upon in 1909 as "providing late results." Only this week a surgical friend has told me of two cases of gastro-jejunal ulcer, one of which formed a jejuno-colic fistula and the other perforated, the first

untoward symptoms having occurred respectively five and ten years after the original operation, so that they would have been included among Mr. Gray's completely successful late results.—I am, etc.,

London, W., March 12th. ARTHUR F. HERTZ.

OPERATIONS ON CHILDREN IN THE OUT-PATIENT DEPARTMENT.

SIR,—I am indebted to Mr. Andrew Fullerton and Mr. Stanley Green for their letters published on March 1st and 8th, and for the support which their experience enables them to give to my position. At present Glasgow is engaged in building a new and enlarged children's hospital, and the arrangements in contemplation for its working come very near the ideal. If the scope of the out-patient department is made sufficiently wide a children's hospital should be capable of giving a much larger return of work done per guinea charitably subscribed than a general hospital.

The ideal children's hospital on its surgical side should consist of:

(*a*) The wards and theatres;

(*b*) A hostel for nursing mothers and sucklings (a cook, a housekeeper, and possibly one maid as staff—the mothers, as in my own little place, doing part of the work gladly);

(*c*) A well-equipped out-patient department and operating theatre, with a staff of visiting nurses and, possibly, *one* emergency bed for each surgeon, the term of residence of any patient being strictly limited to forty-eight hours.

There is a reference in the letters of both Mr. Fullerton and Mr. Green to the out-patient department as a training field for junior surgeons. With that idea I am in agreement. No better training in thoroughness can be had. A carelessly tied ligature in even a triviality like a circumcision in the wards may mean a night-call for the house-surgeon from his adjacent room. In an out-patient it may cause alarm and mean serious danger miles away from hospital. The point I wish to draw attention to is, however, that the training of the junior in the out-patient department must be under guidance, as in the wards. In the Glasgow Children's Hospital there are out-patient surgeons and *assistant* out-patient surgeons, and I am sure my junior colleagues, to whose loyal co-operation I have been much indebted, will bear me out that the arrangement under which they learnt their work, relying on the support and advice of a senior colleague, is a good one for them, as it certainly is for the patients.—I am, etc.,

Glasgow, March 8th. JAMES H. NICOLL.

THE DISSEMINATION OF RECTAL CANCER.

SIR,—In your issue of March 1st last there appears an editorial paragraph headed "Intramural Spread of Cancer of the Rectum," a review of a paper by Mr. Percival Cole in the same issue. With your permission I propose to offer a few remarks upon this paragraph, which in some respects misrepresents my views upon dissemination in rectal cancer.

In a series of about 12 cases of cancer of the rectum I have twice demonstrated appearances which appear to indicate permeation of the mucous lymphatic plexus in apparently healthy bowel near a rectal carcinoma. In a series of 20 cases Mr. Percival Cole has been unable to find any similar appearances. Clearly, therefore, the process of mucous permeation is an exceptional one. Your reviewer says, quite truly: "No support is given to Handley's theory of mucous and submucous permeation" by Mr. Cole's paper. I have not formed any theory on the subject, but have simply stated my observations in 2 cases. It should have been added that neither is any argument adduced by Mr. Cole to show that my observations are incorrect. It is worth noting that upon the strength of a single case in his series of 20, Mr. Cole has himself described permeation of the intramuscular plexus as a mode of spread of rectal cancer. This he is well justified in doing, nor am I entitled to deny the correctness of his observations simply because no similar case happened to be included in my own series. My series has no bearing on this particular question, nor has his series of cases any value whatever as evidence against the correctness of my observations on mucous permeation as an exceptional process. Your reviewer goes on to say in reference to my work: "It is thought improbable that the discrete well-formed cells which that keen observer described—cells which have no histological resemblance to the columnar cells of the rectal epithelium—were disseminated cancer cells." A careful perusal of Mr. Cole's paper finds in it no basis for this *ex cathedrâ* statement, which usurps authority from its position in your editorial columns. At this point the limelight is withdrawn, and your reviewer entirely withholds the inside knowledge which he evidently possesses as to the nature of the cells in dispute. I have it on his authority that they are not cancer cells; may I hear on the same authority what they are? I feel, Sir, that in such a debatable question unsupported assertions on either side are not entitled to the advantages of anonymity and authority which your editorial columns give.

May I, in conclusion, express the genuine pleasure which Mr. Percival Cole's valuable work, containing so much that is new, has given me. It has justified the hopes I entertained of the mucicarmine method of staining when I first suggested its use as an instrument for the study of cancer. Incidentally I may add that it has confirmed my main conclusion that "effective dissemination probably, as a rule, occurs through the mesorectum or perirectal tissue opposite the primary growth," a conclusion which may well come as a surprise to those whose knowledge of my views is derived from your reviewer's paragraph.—I am, etc.,

London, W., March 11th. W. SAMPSON HANDLEY.

*** The above letter has been read by the writer of the annotation, who replies as follows: Mr. Handley, in his original paper published in the BRITISH MEDICAL JOURNAL on April 16th, 1910, recorded the observation that in sections of one particular rectum which happened to contain a carcinoma there were certain cells in the mucous layer that were stained red by mucicarmine. Now another case has been added which also happens to be from a cancer of the rectum. The difference of opinion is not about the observation itself, but as to the theory of very extensive spread of cancer by the mucous layer which Mr. Handley founded upon it. This theory, emanating from such a brilliant investigator, even though it rested on slender grounds, might well convince the ordinary surgeon of the hopelessness of surgical intervention. The onus, however, of proving, in contradistinction to assuming, that the red-stained cells are *cancer* cells rests entirely on the originator of the theory, and cannot be established by dialectics.

PHYSICAL SIGNS OF MYOCARDIAL INVOLVEMENT.

SIR,—Dr. Thomas Lewis's valuable paper published in your issue of March 8th is of particular interest to students of cardiac rheumatism because of his allusions to the occurrence of heart-block in some cases of that disease. It is nowadays generally recognized that in all cases of active rheumatic carditis the cardiac musculature is besprinkled with inflammatory foci; and, indeed, this disease being so common, it seems probable that of all the localized injuries to which the myocardium is prone, that which is inflicted by the *Streptococcus rheumaticus* is the most frequent. Since this is so, it is not surprising that Dr. Lewis should expect to find in cases of cardiac rheumatism numerous illustrations of those principles of cardiac localization for the discovery and enunciation of which we are so deeply in his debt.

Dr. Lewis says that "heart-block is not an uncommon accompaniment of acute or subacute rheumatism," and there are several remarks to this same effect in the course of his paper. If the point were not one of some little importance, I would not venture even to question the accuracy of so authoritative a statement; but since there is reason to believe that disturbances of conductivity were comparatively rare in cardiac rheumatism, I think the grounds for this belief may be placed before your readers for criticism.

First, the total number of recorded instances of rheumatic or post-rheumatic heart-block of the medium or higher grades is very limited; I believe I am right in

saying that it does not exceed forty. Now cardiac rheumatism is one of the commonest of visceral diseases; many thousands of cases are admitted annually to the hospitals of Britain alone, and since in almost every medical school there is at least one cardiographic enthusiast, it might be expected that if the incidence of heart-block amounted to 1 per cent. of all cases of cardiac rheumatism, we should have heard of a much larger number of examples. My own experience, indeed, can only furnish two instances; and neither of these occurred in routine practice, but both were brought to my notice by colleagues.

Secondly, the occasional dropping of beats—a manifestation of heart-block which does not escape the ordinary observer, though unarmed with apparatus for its graphic registration—is, in my experience, an exceedingly rare phenomenon in active rheumatic carditis; and I find that this is the opinion of others who have studied the disease from a general standpoint. If heart-block were at all common in cardiac rheumatism, surely dropped beats would be encountered in a fair proportion of cases.

Thirdly, I have for some time past been taking polygraphic records from cases of cardiac rheumatism in both the acute and the residual phases, cases of every grade of severity and of every variety, without selection. The number of cases at present investigated lies between 100 and 200. I do not regard this research as complete without application of the more delicate electro-cardiographic test, on which Dr. Lewis has taught us to rely; but so far as it goes, it seems to show that rheumatic invasion of the heart does not often lengthen the *a–c* interval.

I said at the beginning of this brief argument that the point is not unimportant. Its significance lies in this: rheumatic myocarditis is a compound of interstitial foci of inflammation with regressive changes within the muscle cells, and thus affords an excellent opportunity for testing the relative susceptibility of the myocardium to focal interstitial and to diffuse intracellular lesions. My own investigations have led me to agree with what Dr. A. M. Gossage argued in a paper published in the *Lancet*, August 21st, 1909, that the direct effect of the inflammatory spots on the myocardial functions is probably small. The comparative rarity of heart-block is a striking illustration, especially if we compare it with the fact (which Dr. Lewis quotes from Professor Aschoff) that the conducting system of the heart is more often a seat of these foci than some other parts of the cardiac wall.

It is probable that Dr. Lewis sees an unusually large proportion of cases of rheumatic heart-block, because they gravitate naturally towards so conspicuous a luminary of the cardiological constellation; and it is therefore all the more necessary that the experiences of those who see the average as well as the special cases should be recorded.

I should like, in conclusion, to express complete agreement with Dr. Lewis's concept of the rheumatic process. Undoubtedly the heart is reinvaded from without by new batches of micro-organisms, which, while dwelling securely in some part of the body—for example, the tonsil—enter the circulation from time to time, each instalment inflicting fresh damage on an already injured heart. The transient nature of the rheumatic heart-block, to which he alludes, is perhaps partly explained by the fact that the inflammatory spot of cardiac rheumatism is in the beginning a vasular occlusion, so that to its pressure effects it adds that of a hinderer of nutrition, and recovery is in part dependent on the successful re-establishment of nutritive supply.—I am, etc.,

Clifton, Bristol, March 10th. CAREY COOMBS.

RECENT ADVANCES IN THE DIAGNOSIS, PROGNOSIS, AND TREATMENT OF HEART DISEASE.

SIR,—It was with strong feeling that I read in the BRITISH MEDICAL JOURNAL of March 8th the address delivered by Dr. F. W. Price to the Academy of Medicine in Toronto.

The expounding of the views of new writers, and the reiteration of facts which they have recorded, is certainly permissible in the columns of a general medical journal—nay, more, it is necessary if our profession is to be acquainted with the progress in medicine. Nevertheless, common courtesy and common custom demand that the statement of view or of fact should be made with specific reference to its source, except where such view or fact has long been known and is generally accepted.

In the spring of last year I published a small handbook on *Clinical Disorders of the Heart Beat*, an epitome of some five years' steady work, and containing much original matter. Within a few months of its appearance Dr. Price delivered the autumn address at Toronto, which is now printed in the columns of your JOURNAL. Without any attempt at acknowledgement, and with never a hint that the basis of his statements—for examples, *vide infra*—was not his own original work, Dr. Price would appear to have transferred to this address much of the substance of my writings, paragraphs therein being, with but slight verbal differences, practically identical in point of language. The teaching of a book which has hardly had time to enter circulation is utilized and scattered broadcast in the thousands of copies of your JOURNAL. I could not but protest in the interests of my publishers. Dr. Price has described auricular fibrillation in the manner of an observer at first hand. It would be of interest to hear from him what, if any, new facts he has added to our knowledge of this subject. The matters to which I direct attention are best appreciated by a comparison of the address and my books in their entirety; but I append a list of parallel paragraphs in illustration of my complaint. The paragraphs which I have selected are those which bear the closest resemblance in point of diction. It would be easy to quote other paragraphs or to lengthen those which I have chosen.

THE ADDRESS.	"CLINICAL DISORDERS" AND "MECHANISM OF THE HEART BEAT."
Premature Beats or Extrasystoles.	
(p. 479)* "They may be present in people with a history of rheumatic infection, in *excessive tobacco smoking, digestive disturbances*, supernomal blood pressure, neurasthenia, and as a result of administration of certain poisons, especially *digitalis, aconitine, muscarine, physostygmine, and adrenalin*." [The italics in this and other instances are my own.]	(p. 44)* . . . "A history of rheumatic infection is certainly common. . . . In young adults, *excessive tobacco smoking* is recognized as an exciting cause of their temporary appearance. *Digitalis* and its allies are not uncommonly responsible, . . . There are also clinical associations between premature contractions, raised arterial pressure and *digestive disturbances*," For the full list of drugs see *Mechanism of the Heart Beat*, 1911, p. 126, my first book. "They [i.e., premature contractions]† are also seen as a result of the injection of certain poisons, and notably *digitalis, adrenalin, aconitine, muscarine, and physostygmine*." [As a matter of fact, this statement applies to experimental work and not to clinical cases. It has not been shown that the last four drugs act in this manner clinically. Even the unusual spelling of "physostygmine" is rendered.]
After *two* lines, the address continues:	
"An individual with extrasystoles may be quite unconscious of their presence. On the other hand, he may experience sensations, and these may cause *worry and anxiety*, particularly if they occur after the patient has *retired to bed*. (Nine lines omitted.) The patient may complain of a *sensation of gripping in the throat*."	(p. 51) "In a very large number of those affected, the disturbances of heart rhythm pass unnoticed. On the other hand premature beats are not an uncommon cause of what patients term 'palpitation.' . . . When numerous, they sometimes occasion actual distress; by calling attention to the heart, they often induce *worry and anxiety*. . . . They are often more noticed after the patient *retires for the night*. . . . consciousness of shock to the chest wall and frequently by *a feeling of gripping in the throat*."
And a little later:	
(p. 479) "*The bromides* are sometimes of value in *masking or modifying* the symptoms, especially in nervous subjects."	(p. 54) "The symptoms are usually *masked or* considerably *modified* by *the bromides* . . . and these drugs are especially useful in tiding a nervous or excitable patient over a period of disturbance."

* Except where the reference is named, the page numbers refer to your JOURNAL and to the book *Clinical Disorders*.

† This interpolation is not in the original.

Heart-block.

(p. 480) "The only point I should like to mention is that *heart-block of mild degree*, giving rise to 'dropped beats,' sometimes occurs during the course of infective diseases, and is then frequently the *only sign of myocardial damage*. When present it increases the gravity of the primary disease. As a rule, however, it is temporary."

(p. 35) "But temporary *heart-block of mild grade* is not uncommon during the febrile attacks to which rheumatic patients are liable; it occurs also in pneumonia and typhoid. The appearance of this abnormal mechanism is of great importance, for it is often the *sole sign which indicates that the myocardium has been damaged*. Whenever it complicates an acute infection it consequently increases the gravity of the prognosis; at the same time it should be understood that the normal mechanism is usually recovered."

Pulsus Alternans.

(p. 480) "*It is very unfortunate, but undoubtedly true, that in the vast majority of cases* it is necessary to take a tracing of the radial artery in order to recognize it. Very rarely in cases *in which it affects the pulse continuously it is perceptible by the finger.*"

(p. 94) "*It is an unfortunate fact, but nevertheless true, that most instances of* pulsus alternans cannot be recognized by other than instrumental means. There are patients *in whom it affects the pulse continuously*, and in whom alteration in the force of alternate pulse beats *is perceptible to the finger*; but such cases are rare."

Auricular Fibrillation.

(p. 481) "*Rarely or never do two beats of the same character or length follow each other.* The irregularity is more pronounced when the pulse is fast. *With the slower rates* we may have to adopt *careful measurements of the tracings*, as the variations in the length of pause are only small. *The pauses between the beats show no relationship to each other*, and there is seldom any *relation between the strength of a beat and the length of the pause which preceded it*—that is, *a strong beat may succeed a short pause, and a weak beat may follow a long pause.*

(*Mechanism of the Heart Beat*, p. 196) The heart action is never regular, and *seldom or never do two beats of the same character or length succeed each other. . . .*"

(Ibid., p. 196) "It is usually at these fast rates that the disorderly character of the pulsation is so prominent. *With the slower rates* the irregularity is less marked; nevertheless, it is always present, a fact which can be determined by *careful measurement of the tracings. . . .* The second criterion consists in the absence of a definite and continued *relationship between the strength of a beat and the length of the pause which precedes it.*"

(Ibid., p. 196) "*The pauses betwixt the beats bear no relationship to one another.*"

(*Clinical Disorders*, p. 79) "Proportion between the force of an arterial pulse and the pause preceding it is often lost (Figs. 39 and 40); *a strong beat succeeds a brief pause and a weak beat succeeds a long one.*"

(p. 481) "What is meant by auricular fibrillation? By it is meant a condition in which *co-ordinate contraction in the auricle is replaced* by incoordinate contraction. Instead of contracting in an orderly and simultaneous manner during systole, the individual fibres contract rapidly and independently of each other. The result is that *systole, either partial or complete*, of the chamber as a whole *never takes place.*"

(p. 71) *Definition of Auricular Fibrillation.*

"*Co-ordinate contraction in the auricle is lost*," etc.

(p. 72) "The fibres of the auricles do not contract coordinately or together, but the tissue is broken up into a number of independently active areas."

(p. 71) "the muscular walls are maintained in a position of diastole; *systole, either complete or partial, is never accomplished.*"

(p. 481) "Patients may also complain of *fluttering in the chest and neck* or *of irregular action of the heart*. Apparently, however, they never suffer from *angina pectoris.*"

(p. 82) ". . . Patients, who possess the persistent disorder, often experience occasional *fluttering in the chest and neck* and may be conscious *of irregular heart action.*"

(Footnote, same page) "On the other hand they seem peculiarly exempt from *angina.*"

(p. 484) "In the most acute cases of cardiac failure, when it may be desirable to elicit a more rapid effect, . . . strophanthin may be administered intravenously, either *two or three doses of* $\frac{1}{250}$ *of a grain at an interval of two hours*," etc.

(p. 89) "When a patient who has fibrillation is first seen and the heart beats persistently at 170–200 per minute, the condition is urgent. . . . The intravenous injection of strophanthin is also valuable at such times. *Two or three doses of* $\frac{1}{250}$ *of a grain . . . are given at an interval of two hours.*"

—I am, etc.,

London, W., March 8th. THOMAS LEWIS.

THE NEGLECT OF VACCINATION.

SIR,—I accept with pleasure the apology so frankly given by Dr. Millard, who invites me to further consideration of the question whether it is safe for this nation to abandon the practice of vaccination, and to rely entirely on isolation of small-pox cases as they occur, for that is the real issue between us.

Dr. Millard endeavours to prove that small-pox is not peculiarly fatal to unvaccinated infants, as is usually believed, because only three infants died during the Leicester epidemic, being 25 per cent. of cases under 12 months old. But Dr. Millard himself allows that this epidemic was of a very mild character; and this opinion was confirmed by Dr. Allan Warren, then resident medical officer of the Isolation Hospital in Leicester, in a paper contributed to the *Practitioner* in 1904. Moreover, an outbreak of only 700 cases is too small for the foundation of new generalizations on small-pox. I prefer to continue to believe that small-pox is very fatal in early infancy.

Dr. Millard admits the efficacy of vaccination as a protection, and states that he yields to no one in his advocacy of it, used as it is used in Leicester—that is, when epidemic small-pox is present and the population are so alarmed that they all rush to be vaccinated, as they do. All of us who have had experience of such periods of alarm know what a difficulty it is to make the existing machinery of public vaccination equal to the strain placed upon it, especially in rural districts. If this machinery is scrapped it will be impossible to get a sudden efficient vaccination of the population, even in a small area, within the necessary period.

Dr. Millard writes and doubtless believes that the whole of the kingdom enjoys a highly organized and well-staffed public health service such as most of our large boroughs possess. But this is not the case universally, and small-pox is not dealt with "according to modern methods," to use Dr. Millard's phrase. We shall unite in regretting that this is the case, but until such methods are universal I maintain that the large percentage of unvaccinated persons in the country is a grave danger—a danger increasing not by arithmetical but by geometrical progression.—I am, etc.,

Westerham, March 9th. ARTHUR MAUDE.

SIR,—After an experience of seven outbreaks of small-pox, like Dr. Killick Millard, I am a believer in the efficacy of, but not in the universal necessity for, vaccination.

To my mind an outbreak of small-pox can be well likened to an outbreak of fire, and our public health departments to the fire brigade. In both we have "notification" and, as far as possible, "isolation." Vaccination we might compare to the water used. All contacts should be vaccinated. Water should be poured upon all adjacent combustible material. I have seen vaccination, done in the early stage of small-pox, modify an attack. Water used early may suppress a fire.

We might, of course, so soak all buildings and their contents with water that they could not take fire; but I am inclined to think that the inmates would get as tired of it as the general public has of vaccination. With a fire next door we should have no difficulty in getting permission to pour water on a house and, with small-pox next door, we should have no difficulty in getting people to submit to vaccination.—I am, etc.,

Bideford, March 11th. GEORGE RICE, M.D.

ASSISTANT MEDICAL OFFICERS IN ASYLUMS.

SIR,—The report in your issue of March 1st (p. 454) of Dr. J. Beveridge Spence's paper, at the meeting of the Medico-Psychological Association, is very interesting. He very rightly appeals for candidates for these posts who have some knowledge of psychiatry or a desire to acquire it. There is, however, a certain feeling amongst men in the service at present that Dr. Spence's ambition and many medical superintendent's requirements are at considerable variance. The administration of lunatic asylums is watched, both centrally and locally, with a very critical eye, and in case of any irregularity, whether it has a strict medical bearing or not, the question arises

how it was dealt with by the superintendent. He for his part has no desire to crib, cabin, and confine himself to the asylum premises all the time, so it is naturally convenient for him to be able to say that, although absent himself, he left two or more experienced men to act in his place. The more men he leaves the better it looks. The rest is easy to follow. A docile type of assistant is required, who has some common sense, little initiative, and attenuated ambition, content to plod along with routine duties, occupying his far too abundant leisure with cricket, tennis, etc., all about the doors of the institution, who can be relied on not to do anything important in his patron's absence. Such a career would hardly appeal to many of the men Dr. Spence desires to see enter the service. In justice, of course, it must be admitted that many superintendents encourage research, but, when all is said and done, scientific research, irksome if simple duties, and indifferent cricket with patients do not constitute a very complete life for the majority. Let the county councils step out and treat their asylum physicians as they do their other medical employees, relieve them of their schoolboy dependence, let them have full opportunities for ordinary social intercourse, marry after a certain approved service if they feel so inclined, and generally give them the status of a citizen. By doing so they will get picked men, capable of sharing and being held responsible for many of the superintendent's now too many responsibilities, to the great benefit of the patients, the superintendent, and themselves.—I am, etc.,

March 3rd. MORE FREEDOM.

MEDICAL INCUNABULA.

SIR,—In connexion with the German Commission for a General Catalogue of Incunabula, the Bibliographical Society is collecting information upon the incunabula in the libraries and elsewhere in this country. To this I should like to call the attention of those interested. It is easy to get the necessary information from the libraries of the Royal Colleges, but I would like particularly to know of:

1. Any fifteenth century medical works in the libraries of the hospitals and medical societies.
2. Medical incunabula in private collections.

—I am, etc.,

WILLIAM OSLER,

Oxford, March 8th. President of the Bibliographical Society.

THE IMPORTANCE OF CHEST HOSPITALS.

Professor Koch's Opinion.

SIR,—In regard to the proposed sale of the Mount Vernon Consumption Hospital, the following extract from the late *Professor Koch's address* at the first International Congress on Tuberculosis, held in London in July, 1901, is of great interest. Speaking of the part played by special hospitals in the prevention of tuberculosis, Professor Koch uses the following words:

> The only country that possesses a considerable number of special hospitals for tuberculous patients is England, and there can be no doubt that the diminution of tuberculosis in England, which is much greater than in any other country, is greatly due to this circumstance. I should point to the founding of special hospitals for consumptives and the better utilization of the already existing hospitals for consumptives as the most important measure in the combating of tuberculosis, and its execution opens a wide field of activity to the State, to municipalities, and to private benevolence.

Such words indicate the seriousness of taking such a step as has been contemplated by the Mount Vernon Hospital authorities, contrary to the expressed wishes of the medical staff.—I am, etc.,

London, W., March 12th. R. MURRAY LESLIE.

A GERMAN Congress on alcohol in youth will be held in Berlin during Easter week, and on Tuesday Professor Aschaffenberg of Cologne, in the course of a discussion on the scientific study of alcoholism, will read a paper on the physiological action of alcohol.

Public Health AND POOR LAW MEDICAL SERVICES.

REDISTRIBUTION OF POOR LAW MEDICAL DISTRICTS IN THE BURNLEY UNION.

IN commenting on the difficulty that has arisen between the Burnley Guardians and the local profession with regard to the treatment of their district medical officers (BRITISH MEDICAL JOURNAL, March 8th, p. 533), the hope was expressed that at a final meeting of a special committee of the guardians appointed to consider the matter some means would be found to settle the dispute on an equitable basis. This hope has not been fulfilled, for the committee recommended that the union should be divided into fifteen districts, that the present public vaccinators be given twenty-eight days' notice, and that each of the newly appointed medical officers be made public vaccinator for his own district. These recommendations were carried at the next board meeting by a large majority. This rearrangement of the medical districts is strongly opposed by the local profession. The Burnley Division of the British Medical Association has approached the Local Government Board, asking that its consent be not given to the scheme. It is urged that the new districts have been made in a very arbitrary manner, and would result in much inconvenience both to the doctor and the Poor Law patient, and that in some which have no poor residents nearly the same salary is allotted as in other districts where there is a considerable settlement of the poor. The Colne and Brierfield District Councils have also protested against the arrangement, so that it does not appear satisfactory to any but the present guardians of the union. It is further alleged that the latter have hurried on the matter in order to establish the proposed scheme before the approaching election of a fresh board. It is to be hoped that the Local Government Board will review the matter very carefully before giving official sanction. We feel sure that the local profession will maintain without wavering its strenuous opposition to a scheme which it regards as harmful to the sick poor and to the profession.

It would appear that the Burnley guardians have already given notice to the present public vaccinators to determine their appointments. This has been done without waiting for the sanction of the Local Government Board, which has invariably refused to permit public vaccination to be utilized for Poor Law purposes, as it has always rightly considered that the duties of a public vaccinator are quite distinct from those of a Poor Law medical officer; and, further, that it is not for the good of the public, nor does it tend to efficient public vaccination to mix it up with the Poor Law. A similar attempt was made some years ago by a metropolitan board of guardians, but permission was refused by the Local Government Board, and we trust that the latter will not hesitate to maintain the same policy in this matter that it has wisely adopted in the past.

LOCAL GOVERNMENT BOARD REPORTS.

Ringwood Rural District (New series, No. 74).—The extensive outbreak of typhoid fever in the town of Ringwood, in Hampshire, in the autumn of last year is the subject of an important report to the Local Government Board by Dr. Hugh A. Macewen, one of the Board's medical inspectors. The outbreak involved seventy-seven persons living in forty-nine houses, and five cases terminated fatally. The population of Ringwood town is about 3,000. In the course of inquiries as to the cause of the outbreak, well-grounded suspicion fell upon a supply of ice cream, but after investigating the circumstances in some detail Dr. Macewen came to the conclusion that it was not an essential factor common to all the cases reported. The water supply of the town is obtained from shallow wells or from the Cockstone stream which courses through a part of the populated part of the town. Although it was not shown conclusively that all those who were attacked had drunk water from this stream, it is certain that the majority of them had. The opportunities for the pollution of the stream were so great through middens, drains, slop water cast directly into it, and other filth found in proximity, that suspicion must be attached to it. A regrettable feature of the report is an account of the attitude of the rural district council in whose administrative area the town is situated in dealing with the epidemic. No provision had been made for isolating any cases of infectious disease, and it was not until a week or two after the commencement of the epidemic, and when forty-eight cases had occurred, that a temporary hospital was established at a disused farmhouse. Still more unsatisfactory is Dr. Macewen's statement that from interviews he had with certain members of the district council, and from

accounts of their meetings, they appeared to be slow and even reluctant to realize the gravity of the outbreak, and he doubted whether, even at its termination, they had fully appreciated the importance of applying the lessons to be learnt from it so as to prevent any similar recurrence.

Obituary.

R. W. PARKER, M.R.C.S.,

CONSULTING SURGEON, EAST LONDON HOSPITAL FOR CHILDREN, AND TO THE GERMAN HOSPITAL, LONDON.

THE announcement of the death, on March 4th, at Freiburg, Baden, of Mr. R. W. Parker, has been received with great regret by those who remember him as a very active worker in the elucidation of disease in children.

Robert William Parker received his medical education at the medical schools of St. Thomas's and of the London Hospital, and after obtaining the diploma of M.R.C.S.Eng. in 1869, was resident medical officer to the Children's Hospital, Great Ormond Street. He also studied at Paris, Munich, and Berlin, and was an excellent German scholar. At the outbreak of the Franco-German war in 1870 he joined the Anglo-American ambulance of the British National Aid Society. For his services at this time he received the decorations of Knight of the Military Order for Merit, Bavaria, and of the Albert Commemoration Order, Saxony. He was appointed assistant surgeon to the Shadwell Hospital for Children in 1876, and, when he resigned in 1902, had been senior surgeon to the institution for some fifteen or sixteen years; he was also surgeon to the German Hospital at Dalston, and at the time of his death was consulting surgeon to both hospitals. He was at one time surgeon also to the Grosvenor Hospital for Women and Children.

We have recently had occasion to refer to the very large part which certain medical societies—especially the Royal Medical and Chirurgical, the Pathological, and the Clinical Societies—played in the medical life of London during the seventies and eighties. Mr. Parker took a prominent part in the work of these societies and contributed a number of papers to their *Transactions*, especially to those of the Clinical Society. The actual list of his papers, however, gives an incomplete impression of the large share he took in the discussion of the many problems presented by disease in children, and especially rickets. He was the author of a book on *Tracheotomy and its After-treatment*. It was an excellent work in its day, and the tracheotomy tube he designed is still by many considered the best. The book reached a second edition, and tracheotomy was the subject of one of the articles which he contributed to Heath's *Dictionary of Surgery*. Among the others were those on surgical affections in childhood, on rickets, and on diseases and injuries of the epiphyses; on these subjects he was an acknowledged authority. He took a very special interest in the Shadwell Children's Hospital; upon his work there we are able to publish the following note from Dr. EUSTACE SMITH, the Senior Physician to the hospital:

"I was for many years a colleague of Mr. R. W. Parker at the East London Hospital for Children, Shadwell, and often had the advantage of his help in the surgical treatment of cases in my wards. His experience in his own department was very large and his opinion in consequence was held in high esteem by the visiting staff. Even the keen critics of the resident staff were often pleased to express their appreciation of his abilities and practical skill, and I never heard that his house-surgeons, who knew his work best, had ever ventured upon a word of unfavourable criticism. Mr. Parker was for a number of years surgeon to the German Hospital at Dalston, and was exceptionally qualified for this position by his experience in the Franco-German war. I remember his telling me once that nothing was so much valued in the commissariat during that campaign as common table salt. Anything else in the way of food or small luxuries the officers and men would willingly share with each other, but common salt every man who was fortunate enough to possess kept religiously for himself. They carried it about in their pockets corked up in hollow goosequills. Mr. Parker had much hard-headed, sound common sense, and although disposed, perhaps, to confine his attention too exclusively to one aspect of a question, was a most helpful colleague and thoroughly alive to the best interests of the hospital. He thought strongly, and expressed his views at times with bluntness, but his honesty of purpose was too evident for a hasty expression to excite ill feeling amongst those from whom he happened temporarily to differ. He was much liked and respected by all, and I shall never cease to look back with pleasure upon the old times when our work together at the hospital brought us into such intimate association."

On his retirement from the Shadwell Hospital in 1902 Mr. Parker went to live at West Grinstead; later on he moved to Bedford for the education of his two sons. He had married rather late in life, and his widow survives him. About four years ago he went to live on the Continent, and, as has been said, death overtook him at Freiburg.

FREDERICK POYNTON WEAVER, M.D.LOND., M.R.C.P., J.P.,

FORMERLY OF FRODSHAM.

THE death of Dr. Weaver, on February 27th, at the age of 79, removes one who to the last was engaged in active work, though he had for many years retired from ordinary practice. He came of a family who lived in or near Chester for generations, his father being surgeon to the Chester Infirmary. He was educated at Queen's College, Belfast, and at Guy's Hospital. He obtained the diplomas of M.R.C.S.Eng. and L.S.A. in 1858, and took the M.B.Lond. with honours in 1860 and the degree of M.D. in the following year; in 1893 he became M.R.C.P.Lond. He held the post of House-Surgeon at the Liverpool Northern Infirmary, and afterwards for thirty years was in general practice at Frodsham, near Chester, where the remembrance of him is still vivid. On retiring from practice in 1892, he took a house at Hampstead—Cedar Lawn, near the top of the Heath—and, instead of seeking a life of ease, at once devoted himself to the various kinds of missionary interest in which he had been interested previously. He became a member of the committee of the Church Missionary Society, and of the Medical Committee, which is responsible for the society's medical missions; since 1898 he had been a member of the Medical Board, which is concerned with health questions affecting the society's missionaries, and on the night of his death he retired to bed early in order to attend the Medical Board on the following day. He was also a member of the Committee of the British and Foreign Bible Society and of various philanthropic institutions, and was an active organizer and worker in the Kentish Town Medical Mission. For several years he was churchwarden of Christ Church, Hampstead; he was a Justice of the Peace for the County of London and for several years Chairman of the Hampstead Bench. He married, in 1866, Mary Berry, daughter of Mr. E. Abbot Wright, of Oldham and Castle Park, Frodsham, who died in 1909, and leaves three sons and four daughters. Dr. and Mrs. Weaver were the centre of a large circle of friends who exercised a very far-reaching influence, and his loss is mourned by those who knew him, and not least by those were engaged with him in work in connexion with the societies referred to, who feel that they have lost a wise counsellor as well as an affectionate friend.

A GREAT many members of the medical profession in Edinburgh remember Sir JAMES GRAHAM, former Mayor of Sydney, whose death was announced on March 8th. He was born in Edinburgh in 1856, and, but for a burgh bursary, would hardly have been able to enter the university. He graduated M.A. in 1879, and M.B., C.M. in 1882, and thereafter for a short time he practised medicine in Leith. During his student career he formed a friendship, which greatly influenced his after-life, with T. P. Anderson Stuart, the Ettles Scholar of 1880, who afterwards became a professor in Sydney. Dr. Graham sailed for Sydney in 1884, having been appointed surgeon on one of the Loch Lyne vessels; he practised and gained a knowledge of hydatid disease in its clinical aspects which enabled him to win a gold medal for his M.D. thesis at Edinburgh University in 1889. He studied in Berlin, Vienna, and Paris, and then returned to Sydney and became associated with his old friend, Professor Anderson Stuart; he held many posts, including those of Lecturer

in Midwifery, Sydney University, and of Honorary Medical Officer of the Lying-in Hospital there. Through his interest in public health he was drawn into the vortex of politics, and this led on to his being made Mayor of Sydney. He received the honour of knighthood when King George V, then Duke of York, visited Australia. He paid several visits to his native city, but it was in Sydney that his death took place at the comparatively early age of 57.

WE regret to have to record the death of one of the oldest medical practitioners in the North of Scotland—Dr. SCLANDERS of Nairn. He was born at Fowes eighty years ago, and received his early education in that town. He took the M.A. degree at Aberdeen University in 1856, and afterwards went to Edinburgh for his medical course, taking his M.D. in 1859. Dr. Sclanders became House-Surgeon to the Edinburgh Infirmary, and soon afterwards was appointed assistant to Professor Simpson, in which capacity he served for three years. He commenced practice in Nairn over fifty years ago, and soon acquired a large practice. He was appointed Medical Officer for the burgh over fifty years ago, and performed his duties with ability and success. All along he took a keen and active interest in the welfare of the town and County Hospital, of which institution he was for many years one of the most active medical officers. His hobby was gardening, and he had a rare and delightful collection of flowers and plants. Dr. Sclanders was twice married, and is survived by Mrs. Sclanders and six sons.

Dr. THOMAS H. MEIKLE, the managing director of Strathearn Hydropathic, died on March 3rd. Dr. Meikle was a native of Roxburghshire, where his father held the appointment of factor on the estate of Colonel Sprot, of Riddell. He studied at the University of Aberdeen, and after taking the degree of M.D. succeeded his brother in practice in Aberdeen. Afterwards he took up the active management of Lochhead Hydropathic, near Aberdeen, and later on established the Strathearn Hydropathic. He was one of the county Justices of the Peace, and was warmly interested in the temperance cause. When the Royal Hotel of Crieff was put into the market over a year ago he purchased the buildings at a cost of nearly £4,000, and gave them to the community to be carried on as an institute on temperance lines. Dr. Meikle, who was in his 79th year, had been ailing for some months, and had not lately taken much part in public life, but for several years he was a member of Crieff Town Council, and was one of the honorary presidents of Crieff Unionist Association. He was twice married, and is survived by his widow, and by one son and four daughters by his first marriage.

MANY of his old patients, and visitors to Venice, will be grieved to hear of the recent death of Dr. E. H. VAN SOMEREN, at the early age of 41 years. He was a son of the late Surgeon-General W. J. Van Someren, I.M.S., and was born in 1871, and educated at Mill Hill School and University College, London. He studied at Guy's Hospital, and after taking the diplomas of M.R.C.S. and L.R.C.P. in 1895, held an appointment in the Manchester Children's Hospital. He settled in Venice in 1896, and continued in practice there up to his death. In 1903 he opened a clinic for the reception of private patients. He became specially interested in the study of nutrition, and tried many experiments on himself with the view of ascertaining on how low a protein supply the physiological equilibrium can be sustained. His results were condensed in an article entitled "Was Luigi Cornaro right?" (BRITISH MEDICAL JOURNAL, October 12th, 1901, p. 1082). Van Someren was reluctant to make generalizations, but he kept copious notes at various times for many years of experiments in fasting, low and high protein régimes, and peculiar diets. He read a paper on the water supply of Venice at the Annual Meeting of the British Medical Association in Edinburgh in 1898. About two years ago he discovered that he had diabetes, but in spite of progressive exhaustion and loss of flesh he remained bravely at his work. Last summer he spent a few weeks at Carlsbad and at Mendel in the Austrian Tirol, but derived no real benefit from the treatment. Early in January he went to Syracuse, in Sicily, feeling the need of change and warmth. Towards the end of January he became comatose, and passed away on February 3rd. He was buried at Syracuse. Van Someren will long be remembered by his friends. A man of strong religious convictions, he was conspicuous for his unselfish character and gentle demeanour. He did much good work among the very poor in Venice. He is survived by his widow, who is a daughter of Mr. Horace Fletcher, and four young children, two boys and two girls.

DEPUTY INSPECTOR-GENERAL EDWARD H. EVANS, who died on February 24th, aged 83, received his medical education at Guy's Hospital, and took the diplomas of M.R.C.S.Eng. and L.S.A. in 1851. He entered the service in 1853, became Staff Surgeon in 1862, Fleet Surgeon in 1876, and Deputy Inspector-General of Hospitals in 1884; he retired in 1888. He served as Assistant Surgeon of H.M.S. *Diamond* during the Crimean war of 1854–5, and with the naval brigade at the fall of Sebastopol.

Universities and Colleges.

UNIVERSITY OF CAMBRIDGE.

THE following degree has been conferred:

M.B.—G. Hoffmann.

UNIVERSITY OF LONDON.

MEETING OF THE SENATE.

A MEETING of the Senate was held on February 19th.

Royal Naval Medical School.

The Naval Medical School of the Royal Naval College, Greenwich, has been admitted as a school of the University in the Faculty of Medicine for the officers of the Royal Naval Medical Service.

Examiners in Physiology.

The following have, together with the external examiners, been appointed examiners for the final examination in physiology for internal students: W. D. Halliburton, Chairman (King's College), E. H. Starling (University College), J. S. Edkins (Bedford College and St. Bartholomew's Hospital Medical School), J. Mellanby (St. Thomas's Hospital Medical School), M. S. Pembrey (Guy's Hospital Medical School).

D.Sc. Degree in Physiology (Internal).

The degree of D.Sc. in Physiology was conferred on Mr. Charles A. L. Evans, an internal student of University College who had presented a thesis on the gaseous metabolism of the heart and lungs, and submitted in addition several further contributions to the advancement of science published independently or conjointly.

Regulations for M.D. and M.S. Degrees for Internal and External Students.

It was resolved:

That the regulations for the M.D. Examination for internal and external students be amended by the substitution for the words "the result of independent research" of the following—"the result of his own independent research," and that the regulations for the M.S. Examination be similarly amended.

Publication of Pass Lists.

It was resolved:

That the date of the announcement of the results of the First Examination for Medical Degrees, of the Preliminary Examination in Veterinary Science, and of the Intermediate Examination in Veterinary Science, Part I, for internal and external students to be held in December, 1913, be the Wednesday in the fourth week following that in which the examinations close, and that in subsequent years the date of commencement of these examinations be the first Monday following December 7th, instead of as at present, the first Monday following December 10th.

Appointment of Representatives.

Dr. F. Taylor was reappointed to represent the University on the General Medical Council, and Dr. F. R. Walters was nominated for reappointment to represent the University on the governing body of the Farnham Girls' Grammar School.

Chairman of Professoriate Committee.

The Vice-Chancellor (Dr. Herringham) has been elected Chairman of the Professoriate Committee.

Staff Examiners for 1913–14.

The following are among those appointed staff examiners for 1913–14:

Anatomy.—Alexander Macphail, M.B., C.M., and Professor A. M. Paterson, M.D., F.R.C.S.

Forensic Medicine and Hygiene.—William A. Brend, M.A., M.B., B.Sc., and E. P. Manby, B.A., M.D., D.P.H.
Medicine.—Norman Dalton, M.D., Sidney P. Phillips, M.D., F.R.C.P., H. D. Rolleston, M.A., M.D., F.R.C.P., and W. B. Warrington, M.D., Ch.B., F.R.C.P.
Mental Diseases and Psychology.—Maurice Craig, M.D., F.R.C.P., and William McDougall, M.B.
Obstetric Medicine.—H. R. Andrews, M.D., B.S., and George H. D. Robinson, M.D., F.R.C.P.
Pathology.—Professor R. T. Hewlett, M.D., F.R.C.P., and Professor R. Muir, M.D., F.R.C.P.
Pharmacology.—Professor A. R. Cushny, M.D., F.R.S., and James A. Gunn, M.D., D.Sc (for 1912-13 also).
Physiology.—Joseph Barcroft, B.Sc., M.A., F.R.S., Professor E. H. Starling, M.D. F.R.S.
Sociology.—W. H. R. Rivers, M.D., F.R.S., and Professor E. J. Urwick, M.A.
State Medicine.—John W. H. Eyre, M.D., D.P.H., and T. Morison Legge, M.D., D.P.H.
Surgery.—Frédéric F. Burghard, M.D., M.S., F.R.C.S., William F. Haslam, M.B., Ch.B., Raymond Johnson, M.B., B.S., F.R.C.S., and H. Betham Robinson, M.D., M.S., F.R.C.S.
Tropical Medicine.—C. W. Daniels, M.B., and Professor F. M. Sandwith, M.D.
Veterinary Pathology.—Sir John McFadyean, M.B., B.Sc., and Professor A. E. Mettam, B.Sc., M.R.C.V.S.
Veterinary Physiology.—Professor G. A. Buckmaster, M.D., B.Ch., and W. Legge Symes, M.R.C.S., L.S.A.

Bureau of Information for the Universities of Empire.

A meeting of the elected members of the "Formative Committee," appointed for the purpose of establishing a bureau of information for the universities of the empire was held on January 23rd, when certain steps were decided upon for the collection of information, and the offer of Dr. Alex Hill to act as honorary secretary to the bureau until its work became sufficiently extended to require the appointment of a paid official was accepted.

Proposed University of London Club.

At a second general meeting of graduates, teachers, and officers of the University held on February 17th, the committee appointed on November 28th, 1912, was reappointed and authorized to establish and organize a University of London Club in or near Bedford Square. It was stated that it was hoped to open the club not earlier than May 1st and not later than October 1st, 1913.

Lectures on Advanced Medical Subjects.

The following are the remainder of a series of free lectures addressed to advanced students of the university and others interested in the subjects dealt with.

Middlesex Hospital Medical School.—March 18th, 5 p.m., Dr. W. J. Penfold: Bacterial variation.
St. Bartholomew's Hospital Medical School.—May 1st, 5 p.m., Dr. M. H. Gordon: Sensitized vaccines.
University College Hospital Medical School.—May 5th, 5 p.m., Dr. T. R. Elliott: Disease and the suprarenal glands.
St. Bartholomew's Hospital Medical School.—May 8th, 5 p.m., Dr. H. Williamson: Some factors of importance in determining the significance of albuminuria in pregnancy.
London Hospital Medical College.—May 19th, 21st, and 23rd, at 4.30 p.m., Dr. H. M. Turnbull: Physiological and pathological changes in the structure of arteries and arterio-sclerosis.
Brompton Hospital.—May 28th, 4.30 p.m., Dr. C. H. Miller: The site of tuberculous lesions at different ages.

Chadwick Lectures in Hygiene.

A course of three lectures on infant welfare—(*a*) the mother as source, (*b*) the father as source, and (*c*) environmental influence, will be given by Professor Karl Pearson, F.R.S., probably during May, under the Chadwick trust. A further course of Chadwick lectures will be given by Sir George Newman, M.D., during the session 1912-13.

University Studentship in Physiology.

A university studentship of the value of £50 for one year will be awarded to a student qualified to undertake research in physiology. Candidates must be matriculated students or graduates of the university. Applications to be sent to the Principal, from whom further particulars can be obtained by May 31st.

Rogers Prize, 1914.

The subject of the essay or dissertation for the Rogers Prize for 1914 will be "The Nature of Pyrexia and its Relation to Micro-organisms." Copies of the regulations for the award of the prize can be obtained on application to the Academic Registrar.

KING'S COLLEGE.

The following appointments have been made in the Department of Public Health:

Lecturer in Sanitary Law and Administration.—Dr. E. W. Routley.
Lecturer in Applied Hygiene in the Tropics.—Colonel W. C. King, C.I.E., M.D.
Lecturer on School Hygiene for Medical Officers.—Dr. W. F. Roach.

The laboratories of the College occupy part of the premises of the Charing Cross Hospital Medical School, 62, Chandos Street, W.C.

UNIVERSITY OF ABERDEEN.

Honorary Degrees.

AMONG those upon whom the honorary degree of LL.D. was conferred on February 25th were Dr. D. W. Finlay and Dr. William Stephenson, Emeritus Professors of Medicine and Midwifery respectively. The same distinction was conferred on Dr. Ronald Campbell Macfie, who is the author of the *Romance of Medicine* and of many poems, including an ode written for the opening of the new buildings at Marischal College, Aberdeen. Dr. Macfie, we may note, has this month received the prize offered through the *Poetry Review* for the best poem submitted; the subject of his composition is John Davidson, the poet and philosopher.

CONJOINT BOARD IN IRELAND.

THE following candidates have passed the recent examination for the Diploma in Public Health:

Captain T. C. Boyd, F.R.C.S.I., I.M.S., T. W. Conway, F.R.C.S.I., J. J. Cullen, L.R.C.P. and S.I., C. H. Denham, M.B.Dub. Univ., Captain D. L. Harding, F.R.C.S.I., R.A.M.C., J. O'Regan, L.R.C.P. and S.Edin., *T. E. Rice, L.S.A., *R. F. Williams, M.B.Univ. Camb.

* With honours.

The Services.

PARKES MEMORIAL PRIZE.

THE prize of seventy-five guineas and the bronze medal of the Parkes Memorial Fund have been awarded for 1913 to Major S. Lyle Cummins, R.A.M.C., for his essay on The Causation and Prevention of Enteric Fever in Military Service, with special reference to the importance of "carriers." The subject for the next competition is Heat-stroke: its Causes, Prevention, and Treatment. (The essay should bear evidence of the personal observations and experience of the writer.) Essays bearing a motto and accompanied by a sealed envelope similarly superscribed, containing the author's name, must reach the Secretary of the Prizes Committee, Royal Army Medical College, on or before December 31st, 1915. The competition is open to medical officers of the Royal Navy, Army and Indian services, of executive rank on full pay, with the exception of professors and assistant professors of the Royal Naval Medical College, Greenwich, and the Royal Army Medical College, London, during their term of office.

INOCULATION AGAINST ENTERIC FEVER.

IT is intimated in the Scottish Command orders that in order to encourage soldiers voluntarily to undergo inoculation against enteric fever lectures will be given at stated intervals by medical officers, showing the advantages conferred by this method of protection. The men should be advised to undergo the operation as soon as they attain the age or service that renders them liable for service abroad, and it is suggested that a quarterly inoculation of men volunteering might take place in each garrison. In the event of the numbers wishing to attend at first being very large, the inoculation might take place at monthly intervals instead of quarterly. The men should not be inoculated until they have completed their recruits' course, and the soldier's training should not be interfered with.

Medical News.

COLONEL W. C. GORGAS, of the Isthmian Canal Commission, Panama, has accepted the task of organizing a sanitary system for the port of Guayaquil, Ecuador, which has been known hitherto as the pest-hole of the Pacific.

THE festival dinner of the National Hospital for the Paralysed and Epileptic, Queen Square, W.C., will take place at the Hotel Metropole on April 16th under the chairmanship of Lord Strathcona and Mount Royal, who will be supported by H.R.H. Prince Alexander of Teck.

THE issue of *Nature* for last week, the first number of the ninety-first volume, contains an admirable portrait of Sir J. J. Thomson, with an appreciation of his immensely important contributions to physics by Augusto Righi, Professor of Experimental Physics in the University of Bologna.

ON the recommendation of the Lord Lieutenant, the Lord Chancellor has appointed the following gentlemen to the Commission of the Peace for the County of Aberdeen: Alexander Hendry, M.D., Surgeon Apothecary to H.M. Household at Balmoral, Ballater; James Middleton, M.B., C.M., Peterhead.

AT a meeting to which all British practitioners of otology, rhinology, and laryngology were invited, held at the Medical Society's Rooms, Chandos Street, London, W., on March 12th, it was decided to form a new society for the study of diseases of the ear, nose, and throat.

THE Provost, Magistrates, and Town Council of the Royal Burgh of Linlithgow have resolved to take part in the movement which has been initiated by Mr. Alexander Spence, M.P.S., chemist, Leslie, Fife, to celebrate this year the centenary of the birth of Dr. David Waldie, the Linlithgow chemist and doctor who was instrumental in bringing under the notice of Sir J. Y. Simpson the anaesthetic properties of chloroform. Further donations, however small, should be sent to the honorary treasurer, Mr. John McWhirter, J.P., Union Bank House, Leslie, Fife.

THE annual meeting of the Royal Portsmouth Hospital was held in the Town Hall on February 28th. It was stated that the effect of the Insurance Act on the admission of patients had been slight; only a small percentage were insured persons, and the hospital was as much needed as ever. The Nurses' Home (the local memorial to King Edward VII) which had cost, including furnishing, about £3,000, had been completed and paid for, thanks largely to an anonymous gift of £2,000. There was a slight increase in the amount of annual subscriptions received in 1912, and it was hoped that the day was far distant when the municipalization of the hospital would have to be seriously considered.

THE Society of Carlsbad Physicians announces a prize to be given for the best essay on the treatment of diabetes mellitus, with special reference to balneotherapy. The jury will be: Hofrat Professor Dr. Ritter von Jaksch of Prague, Professor Dr. Luethje of Kiel, Professor Dr. Ortner of Vienna, Professor Dr. Schmidt of Innsbruck, and Dr. Edgar Ganz, President of the Society of Carlsbad Physicians. Either one prize of 5,000 kronen, or two prizes of 3,500 kronen and 1,500 kronen, or three prizes of 2,500 kronen, 1,500 kronen, and 1,000 kronen, may be awarded. The competition is open to physicians of all countries, and any language may be used. Competing essays must be received before December 31st, 1913. Any further information may be obtained from the Society of Carlsbad Physicians in Carlsbad.

THE second International Congress on Life-Saving and Prevention of Accidents will be held in Vienna from September 9th to 13th next. Its business will be conducted in ten divisions; the first two will deal with first aid, professional and lay, in accidents; the third, fourth, and fifth with ambulance work in town and country, on the railway, and at sea; the sixth and seventh with life-saving work in mines and among firemen; the eighth and ninth with life-saving in the mountains and in connexion with sports; and the tenth with the prevention of accidents generally, and with special reference to workmen and public traffic. A British committee has been formed to make arrangements for the congress with the Earl of Londesborough as president and Mr. S. Osborn, F.R.C.S., as secretary. Other members of the committee are Sir J. R. Andrew Clark, C.B., Sir George T. Beatson, K.C.B., Mr. James Cantlie, Mr. Lynn Thomas, C.B., and Dr. F. M. Sandwith.

THE fifth annual report of the Army and Navy Male Nurses' Co-operation shows it to be in a flourishing condition. During the year 1911–12 as many as 381 cases were nursed by members of the co-operation, whilst the average number of nurses employed throughout that year was forty-two. Three of these men, one of whom unfortunately succumbed to an attack of enteric fever contracted whilst on duty, were chosen for service in Tripoli, under the auspices of the British Red Crescent Society. The annual income of the society during 1911–12 showed an increase of £368 14s. 8d., the receipts for the nursing service having amounted to £3,719 16s. 9d. The committee have thus been enabled to acquire a lease of 11A, Welbeck Street, where offices and a residential home for the nurses have been established. Mr. Edward P. Furber has become honorary medical adviser to the society, which has sustained a severe loss through the retirement of its President, Sir Frederick Treves, and the death of its Vice-President Sir William Allchin, who did so much to assist the Co-operation in its early days. The places thus left vacant have been filled by Admiral Sir John Durnford, K.C.B., D.S.O., and Sir Dyce Duckworth.

CHRISTOPHERS (*Scientific Memoirs by Officers of the Medical and Sanitary Departments of the Government of India (New Series) No. 56, Malaria*, Calcutta, 1912, 1s. 4d.) concludes that the chief carrier of malaria in the Andamans is the *Nysomyzomyia ludlowi*, a species which breeds in and about salt swamps and is not found at a greater distance from salt or brackish water than half a mile. Whether any part is played in the transmission of malaria by the other common species, *Nsm. rossi* and *My. barbirostris*, he believes is doubtful. In any case the latter could only be an important carrier within the forest, and the mere clearing of land has made it unimportant even in regard to numbers. Owing to the distribution of *Nsm. ludlowi*, malaria in the Settlement is confined to a belt around the margins of the harbour, and is absent, or nearly so, from villages more than half a mile from the sea coast, or the salt swamps associated with this. This freedom from the disease is found even in inland villages situated on the margins of swamps, amidst rice fields and near jungle. The predominating type of parasite among the children in the villages was simple tertian, while amongst convicts admitted to hospital and amongst the convalescent gang quartan infections formed 50 per cent. or over. Though infection with malignant tertian was very little in evidence during the time of Christophers's visit, yet the only two infected *Anopheles* encountered were infected with this type of parasite.

SHAKESPEARE has truly said that "he that is strucken blind, cannot forget the precious treasure of his eyesight lost," and there can be no doubt that for most people blindness would prove the most intolerable of all misfortunes. Moreover, apart from actual loss of sight, perhaps no greater calamity can befall a child than to begin life handicapped by defective vision; yet it is only of recent years that any definite prophylactic measures have been adopted. Dr. A. S. Cobbledick, whose excellent article on The Wearing of Spectacles by Children appeared in the March number of *The Child*, remarks that it is only during the last twenty years that spectacles have been systematically ordered in cases of refractive errors of vision in young children, and that so far the results have been extremely satisfactory. According to Dr. Cobbledick, excessive nervousness and irritability is often a sign of eyestrain in children, and these symptoms disappear as soon as the trouble is relieved by proper glasses. It should be borne in mind, however, that the latter condition frequently exists along with post-nasal growths, whose removal is imperative if a radical cure is to be obtained. Another and very common cause of suffering in children is bad teeth, and the same number of *The Child* contains an interesting description by Dr. Ernest T. Roberts of the excellent dental clinics recently established by the Glasgow School Board, where the children attending the municipal schools receive free treatment from competent dentists. The number also includes an article on the practice of surgery during childhood by Mr. Edred M. Corner, and an interesting account by Mr. W. Kersley Holmes of the free Kindergarten, founded by Miss Lileen Hardy for the children of the Edinburgh slums.

IN the fourth Galton Laboratory Lecture on "National Eugenics," Dr. David Heron said that it was not generally recognized that, even under present conditions, the great majority of the feeble-minded came under State control; and that although such cases were a source of continual expense, the control of the State was exercised in such a way that practically nothing was done to check their multiplication. Though there could be no doubt that mental defect was hereditary, any attempt to discover precise laws of inheritance encountered many difficulties, owing to the fact that the term "mental defect" covered a multitude of conditions, each of which existed in almost an indefinite number of grades of severity. In some recent attempts to apply Mendelism to such cases the evidence cited told strongly against the theory, and Dr. Heron repudiated the advice that the mentally defective and the insane should intermarry with the normal, and pointed out that on the basis of the Mendelian theory normal individuals could carry the latent possibility of defect for many generations. Such advice, he continued, could only bring the whole eugenic movement into disrepute. What was specially required at the present time was more information. Efforts ought to be made to follow up the children who were passing through the special schools for the mentally defective, and also to trace back the school histories of those who were now mentally defective criminals and paupers. Much yet remained to be discovered regarding the inheritance of mental deficiency; but on the basis of present knowledge it was justifiable to assert that a substantial reduction in the numbers of the mentally defective could be obtained by preventing the feeble-minded from reproducing their kind. The cardinal principle of national eugenics was the distinction between the right to live and the right to parenthood. National eugenics denied to no one the right to live, but it taught that there were certain classes to which the right to parenthood must be denied; and in the case of the feeble-minded it declared without hesitation that their children were better not born.

Letters, Notes, and Answers.

☞ *Queries, answers, and communications relating to subjects to which special departments of the* BRITISH MEDICAL JOURNAL *are devoted will be found under their respective headings.*

QUERIES.

A. E. has a patient, aged 70, who suffers from dyspepsia and irritability of the bowels, following severe gastric influenza; these symptoms are accompanied by bacilluria. He has been treated with urotropine, helmitol, and salol, which increases the irritability of the bowel. Dilution with large quantities of water has been tried, and "A. E." asks what can be done to mask the irritant effect.

ANSWERS.

TABES.

W. writes, in answer to "Fairlands," to suggest that the rectal pain in his case of tabes is probably due to intestinal stasis, and that the remedy is to secure the daily action of the bowels. "W." suggests the following: An hour before bedtime three or four teaspoonfuls of agar-agar (cut small) in a small cup of hot milk with a capsule containing ℥ss of the liquid extract of cascara sagrada; a saline (as apenta) in a tumbler of hot water one hour before breakfast, and a simple normal saline enema to clear out the rectum at the time the bowels act. If these are not sufficient a 2-grain tablet of cascara with ℥j or ℥ij of white vaseline may be taken before teatime.

LEUCONYCHIA.

UNGUIS.—Our correspondent's son apparently suffers from leuconychia totalis, a well-known but rare abnormality of the nails. The appearance is due, according to Unna and most other dermatologists who have had the opportunity of studying the disease, to the presence of air spaces in the nail. Such air spaces are caused by an irregular keratinization of the cells which form the substance of the nail. These shrink unduly and leave spaces which are filled with air. The etiology of the condition is obscure. In Unna's patient, a young man of 26, it was congenital, but in most of the cases published the leuconychia seems to have been established after a local depression of the circulation with consequent coldness of the extremities. Even in Unna's case the patient had cold, somewhat cyanotic, hands. Some observers lay stress on the effects of slight traumatism in causing this curious change in the nails, but there must be in addition some predisposing factor. Leuconychia does not appear to have any special significance. As regards treatment, no satisfactory treatment is known, but, as the pathology of the condition appears to be similar to parakeratosis of the skin, it is just possible that *x* rays cautiously applied might be of some value.

CHEWING GUM.

DR. S. B. WALSH (School Medical Officer, Gillingham, Kent) writes: I agree with Dr. Gilchrist (p. 476) as to the probable beneficial effects of gum-chewing on the development of teeth and jaws. It is a practice in which I must plead occasional indulgence, and my experience satisfies me that it goes a long way towards supplying the cleansing and masticatory deficiencies of modern food. We are told that the food of to-day is too soft and pappy; that it lacks detergent properties: that it fails to encourage the proper secretion of saliva; that it leaves a residue round the teeth to ferment and corrode; and that the present lamentable condition of the national dental apparatus is the net result of the foregoing. Now, the oft-repeated mastication involved in gum-chewing has the following certain effects. It develops the masseters and increases the blood supply of the dental arch and teeth; it flushes the mouth with acid-neutralizing saliva; it acts as an efficient cleansing agent, for the softened gum penetrates the smallest interstices between the teeth; it is mildly antiseptic and markedly deodorant; and, lastly, it is a fine antidote to excessive smoking. I am, of course, well aware that it is a habit which is calculated to irritate somewhat one's aesthetic sensibilities. On the other hand, anything that creates health must be accounted directly or derivatively beautiful, or nearly so—certainly much nearer so than carious malformed teeth. It is worthy of note that a monk who accompanied the Spanish conquerors to Mexico commented on the uniformly regular and beautiful teeth of the Aztec women, which he attributed to the habit, universal among them, of chewing "chicle," the basis of the present-day article. I have often thought that if gum could be popularized among children so as to replace a proportion of the sweets at present consumed, it would result in a noticeable benefit to the teeth of the subsequent adult generation.

TREATMENT OF TAENIA.

A. W.—Our correspondent should consult Sir Kingston Fowler's remarks on the treatment of taenia in the JOURNAL, vol. i, 1905, p. 841. The patient should be kept in bed under close observation; then male-fern will prove the most satisfactory remedy. Private and out-patient cases do not do so well as in-patients simply because they cannot be so thoroughly watched unless they have a private nurse. For two, three, or four days the following diet must be given: Two pints of beef-tea, one tin of Mason's essence, two rusks, and 4 oz. of port wine, whilst the patient takes 2 grains of extract of cascara sagrada three times daily. On the fourth day he should take, about 5 a.m., 1 oz. of haustus sennae co.; at 9 a.m., 15 minims of the extract of male-fern in a capsule, the dose to be repeated at 9.15, 9.30, and 9.45. At 11 a.m. the haustus sennae must be repeated. If by 1 p.m. the worm has not been passed and the head found, a second course of treatment with male-fern at intervals of a quarter of an hour must be carried out, to be followed in an hour by a purgative draught. If the head be not then found a third course of this treatment must be undertaken. As the worm generally breaks at a distance of about 1½ in. from the head, and as the fragment which remains is an exceedingly slender filament, the most careful scrutiny is absolutely needed. The pan in which the motion is passed should be covered with black crape, to throw out in relief the fine white filament terminating in the head.

DEATH OF THE EMPEROR NAPOLEON.

M. D.—The officer acting as orderly officer at Longwood during the closing days of Napoleon's illness was Captain Crockatt of the 20th Regiment, who was appointed to that position on April 14th, 1821. Captain Crockatt was entrusted with the official dispatches announcing the death of Napoleon, and on his arrival in England received his majority and a present of £500. He became General Crockatt and died in 1879, at the advanced age of 87. So far as is known, he did not leave any papers relating to his connexion with Napoleon. Crockatt succeeded Captain Englebert Lutyens of the same regiment, who resigned his position of orderly officer on account of his treatment by Lowe and the commanding officer of the 20th Regiment. Napoleon had presented to Dr. Arnott a copy of Marlborough's *Campaigns* for the library of the 20th Regiment, and Lutyens was commissioned to send them to the regiment. But unfortunately the book was inscribed on the title page with the Imperial "N." and the words "L'Empereur Napoléon." For this reason, and the fact that Lowe thought such a gift might seduce the allegiance of the 20th Foot, the book was sent home to the Duke of York, Commander-in-Chief, for his decision. The Duke of York at once allowed the 20th Regiment to retain the book, saying that "Such a gift from Napoleon to a British regiment was most gratifying to him, and that the safe detention of Napoleon was sufficient testimony that the regiment had done its duty." The book is now in the archives of the 20th Regiment. (See *History of 20th Regiment*, by B. Smythe, M.V.O.)

ACUTE PNEUMONIA DURING TREATMENT WITH ARSENIC.

DR. GEORGE PERNET (London, W.) writes, in reply to Dr. S. M. Hebblethwaite's letter in the JOURNAL of March 8th, p. 529, that a reference to the matter will be found in Kobert's exhaustive *Lehrbuch der Intoxicationen*, vol. ii, p. 263 (Stuttgart: Enke. 1906).

LETTERS, NOTES, ETC.

IN PRAISE OF THE PHYSICIAN.

A YORKSHIRE G.P., who, for reasons of modesty, does not sign his name, writes: Apropos of your article "In Praise of the Physician," the following complimentary and touching sentence, addressed to me by an old Yorkshire farmer on his deathbed, may be of interest as an example of personal esteem to be continued even after death: "I've allus respeckit ye iver sin' I've knawn ye, an' I'll allus respec' ye efter I'm deid!"

POETRY A DISORDER OF THE INTESTINES.

C. writes: Two weeks ago I inserted in the JOURNAL a query as to the origin of the above statement. My learned friend, Mr. C. W. F. Goss, of the Bishopsgate Institute, has kindly furnished me with what appears to be the solution. He points out that Carlyle in his *Signs of the Times* quotes from Pierre Jean Cabanis (1757-1808), physician to Mirabeau, as follows: "As the liver secrets bile so does the brain secret thought, but poetry and religion are a product of the smaller intestines."

CORRECTION.

IN the article on The Knowledge of Tropical Diseases in 1813, published in the JOURNAL of March 1st, p. 455, there was an unfortunate misprint: the dose of laudanum used by Mr. Playfair in combination with half a drachm or a drachm of ipecacuanha was 30 to 60 drops.

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